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Select Committee on Energy

Report on Ontario Hydro Draft Demand/Supply Planning Strategy

Volume I

1st Session, Thirty Fourth Parliament
37 Elizabeth II



LEGISLATIVE ASSEMBLY
ASSEMBLÉE LÉGISLATIVE

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Select Committee
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Report on Ontario Hydro
Draft Demand/Supply
Planning Strategy

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COMMONWEALTH OF AUSTRALIA
PARLIAMENT OF AUSTRALIA

Select Committee
on Energy



Information Paper on Energy
II

SELECT COMMITTEE ON
ENERGY



COMITÉ SPÉCIAL SUR
L'ÉNERGIE

LEGISLATIVE ASSEMBLY
ASSEMBLÉE LÉGISLATIVE

The Honourable Hugh Edighoffer, M.P.P.
Speaker of the Legislative Assembly

Sir,

Your Select Committee on Energy has the honour to present its First Report for the First Session of the Thirty-fourth Parliament and commends it to the House.

Douglas Carrothers, M.P.P.
Chairman

Queen's Park
January, 1989



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FINAL REPORT OF THE SELECT COMMITTEE ON ENERGY

Prepared for:

Select Committee on Energy

Prepared by:

Jerry Richmond and
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Research Officers
Legislative Research Service

January 1989

- * Projects prepared by the Legislative Research Service are designed in accordance with the requirements and instructions of the Committee making the request. The views expressed should not be regarded as those of the Legislative Research Service or of the individual preparing the project.

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SUMMARY OF RECOMMENDATIONS

The Existing Generating System

1. In the planning for and meeting of Ontario's electrical energy requirements, Ontario Hydro and the government should place a high priority on the maintenance, upgrading and refurbishment of the existing generating and related transmission system consistent with the highest standards of environmental protection.
2. An environmental audit should be undertaken by Ontario Hydro of the existing generating system and submitted to the Ministry of Energy for review.
3. The environmental audit should investigate:
 - a. the development of a firm program for the installation of scrubbers or other appropriate emission abatement technologies at Ontario Hydro's coal-fired generating stations.
 - b. the feasibility of constructing an integrated gasification and combined cycle (IGCC) plant in Ontario to demonstrate the viability of this "clean coal" technology.
 - c. the role that natural gas might play in the short-term and medium-term in meeting a portion of Ontario's power requirements. The feasibility of repowering some existing fossil stations with natural gas should also be assessed.
 - d. the refurbishment and modernization of older hydraulic stations . This is desirable since hydraulic installations utilize a renewable resource.
 - e. research programs or measures which may serve to safely extend the service lives of existing nuclear stations.
 - f. the general upgrading of all components of the existing generation and transmission systems to improve reliability and quality of service.

Demand Management

Policy Framework

4. The Ministry of Energy should immediately establish programs using the best available conservation supply curves to identify sectors with the greatest potential for demand management and set priorities for action in a specific two year implementation timetable.
5. The Ministry of Energy should substantially increase its educational and promotional programs related to demand management.
6. No new major Ontario Hydro supply options should be approved until the Ministry of Energy is satisfied that the uncertainty regarding the amount of demand management which can be achieved is reduced by means of effective market research and studies of implementation feasibility.
7. Ontario Hydro and the Ministry of Energy should develop an effective monitoring and post-audit system to determine the amounts of demand reduction being achieved by their programs.

Energy Efficiency

8. The Ministry of Energy should develop a compulsory program for energy-efficient street lighting for all Ontario municipalities to be implemented over a five year period.
9. The government should revise the Ontario Building Code to substantially increase energy efficiency standards for new residential, commercial and industrial buildings.
10. The Ministry of Energy and Ontario Hydro should develop additional programs to improve the energy efficiency of existing residential, commercial and industrial buildings.
11. Regulations should be implemented under the Energy Efficiency Act, 1988 to provide stringent standards for electrical appliances, heating/cooling equipment and other home electrical apparatus which are compatible with the 1992 regulations being implemented in the United States.

Municipal Utilities

12. The Ministry of Energy and Ontario Hydro should develop compulsory demand management programs, including appropriate incentives, for all municipal utilities in the province.
13. The Ministry of Energy and Ontario Hydro should train staff in demand management techniques who would be made available to municipal utilities and other major power consumers to ensure the timely and effective implementation of provincial demand management programs.

Independent Generation and Cogeneration

14. The government should strengthen the Non-utility Generation Advisory Council to identify and eliminate barriers to a successful independent generation industry in Ontario. This body should have representation from the Ministry of Energy, the Ministry of Industry, Trade and Technology, Ontario Hydro, the Independent Power Producers' Society of Ontario and the financial sector and should report to the Minister of Energy annually.
15. The government should initially establish a benchmark price to be paid for independently generated power which will attract sufficient additional generation capacity to ensure the establishment of a healthy private generation sector.
16. Ontario Hydro should pay up to "Full Avoided Cost" for independently generated power subject to policies established by the Ministry of Energy and its Non-utility Generation Advisory Council regarding the location and amount of generation required.
17. The government should establish a body with representation from the Ministry of the Environment, the Ministry of Energy, the Ministry of Natural Resources and Ontario Hydro to recommend and implement preferred regulatory approaches for defined categories of independent power generation facilities which will ensure timely approval of new generation capacity while achieving provincial environmental protection and enhancement goals. It should present its findings within one year of its establishment.

Remaining Hydraulic Potential

18. Remaining economic hydro-electric sites should be developed in an orderly and environmentally appropriate manner. In those instances where Ontario Hydro may not be interested in developing particular sites, these locations should be released to independent generators for possible development.
19. Available hydraulic sites should be developed to maximize positive economic and social impacts to the Ontario and Canadian economies in an orderly fashion. Such developments should also be designed and operated to provide positive local economic spin-offs and employment opportunities, particularly in more remote parts of the province.

Other Major Supply Options

20. The Ministry of Energy should compile on a systematic basis the best available information on economic, environmental and social benefits and costs associated with supply alternatives such as power purchases, clean coal technology, natural gas and CANDU nuclear generation which are currently being evaluated in the power planning process.
21. No major potential supply options should be ruled out of the power planning process until the relative benefits and costs have been determined.
22. The environmental implications of candidate supply options must be a major factor in selecting additions to the Ontario power system.

Power System Planning Process and Regulation of Ontario Hydro

23. The Ministry of Energy in its review and upcoming proposals for revision to the Power Corporation Act should take into consideration the submissions to the Select Committee on Energy (1988-89) on the power system planning process, in particular, and other appropriate matters such as demand management, cogeneration, and private/parallel generation.

The Approval Process

24. The Ministry of Energy should initiate and co-ordinate a critical interministerial evaluation, with the involvement of Ontario Hydro, of the approval process for major electrical generation/transmission projects. This review should identify problems with existing legislation and policies, and put forward recommendations for the possible "streamlining" of this approval process.

Forecasting and Dealing with Uncertainty

25. Ontario Hydro should give high priority to reducing uncertainty in its forecasting.

Role of Natural Gas

26. Ontario Hydro and the Ministry of Energy should reassess the potential role of natural gas in meeting a portion of Ontario's future electrical generating requirements in view of changing market conditions affecting the price and supply of this fuel.

Power Purchases

27. No major firm purchase of power from neighbouring provinces should be pursued until maximum efforts are made to utilize the cost effective indigenous resources of Ontario, e.g., demand management, existing generation, private generation and remaining hydraulic.

Recommendations of the Previous (1985-86) Select Committee on Energy

28. The government and the Ministry of Energy should actively consider the recommendations of the Select Committee on Energy (1985-86) particularly those dealing with demand management/conservation, private generation and the power system planning process.
29. The government and the Ministry of Energy should conduct a review of all pertinent legislation, and the Power Corporation Act in particular, which is relevant to the recommendations of the previous (1985-86) and current (1988-89) Select Committees on Energy. The general objective of this analysis should be to assess the removal of legislative barriers to the achievement of appropriate power planning objectives.

Establishment of a Standing Committee on Energy

30. A Standing Committee on Energy of the Ontario Legislature should be established to review energy matters and Ontario Hydro in particular.

INTRODUCTION AND SUMMARY

Overview of this Report

The Select Committee on Energy was established on February 11, 1988, to "enquire into and report within one calendar year on Ontario Hydro affairs." As the focus of its deliberations the Committee chose to review Ontario Hydro's Draft Demand Supply Planning Strategy (DSPS) (Report 666 SP, December 1987) which was released to the public in December of 1987. DSPS was intended to provide strategic direction to Ontario Hydro in meeting Ontario's electricity requirements into the twenty-first century. This Committee's report provides further guidance to the government, the Ministry of Energy and Ontario Hydro in the planning of Ontario's electrical energy requirements.

The Committee, during its extensive deliberations over eleven months, recognized that the supply of electricity is vital to the functioning of our modern society. Many of the advanced technological processes and equipment which we have come to rely upon depend on a reliable and economical supply of electricity. The Committee has also learned that the continued supply of electricity is a complex planning matter with a broad range of alternative and diverse environmental, social, economic and public policy implications.

As noted in the Report of the Electricity Planning Technical Advisory Panel on DSPS (EPTAP - July 1988), future electrical energy planning must account for evolution and change and has an element of uncertainty and risk. (Appendix A contains a listing of major technical studies relevant to this Committee report).

Planning, however, is quintessentially forward-looking, involving the development of a strategic focus within which to execute and evaluate tactical initiatives. Any meaningful plan will be in a state of continuous evolution. This will be particularly true of planning to meet electric service needs in Ontario as the province looks into the next century. No comparable geographic area in North America has experienced more dynamic expansion in recent years than Ontario. Fundamental policy decisions relating to trade, taxation, and migration will be made in the months and years immediately ahead that will profoundly influence future economic growth and thus future electric demand in the province.

Demand-sided factors in electricity will be filled with a multitude of considerations causing uncertainty and risk. A planning framework that works in this environment must accordingly have substantial room for flexible response. But flexibility appears increasingly illusory when

examining supply-side factors in electricity planning. The supply problem is particularly acute for Ontario as sites for hydro-electric power are being exhausted, as the province has very limited indigenous oil, coal and natural gas for thermal generation, and as environmental and safety concerns about nuclear power persist to the point of impeding developmental actions significantly (pp. 50-51).

In its approach to assessing and making recommendations on DSPS, the Committee has concentrated upon reviewing the five "Priority Strategic Directions" as expressed in Ontario Hydro's DSPS Summary Report (Draft Demand/Supply Planning Strategy, Report 666B SP, September 1988) rather than the more specific strategy statements of the "full strategy" (see Appendix B). These five points, in the Committee's view, provide key opportunities for the development of public policy and the Committee in turn has sought to provide direction on those policy matters that most merit attention. Appendix C contains a Glossary of terms relevant to power and system planning. These five strategic statements, which are reproduced within the body of this report, deal with the role of:

- the existing power supply system;
- demand management which encompasses conservation;
- private or independent generation;
- remaining hydraulic sites; and
- other major new supply options (coal, oil, gas, nuclear or purchase) in meeting Ontario's future electrical energy requirements.

The key to the Committee's position on these strategic directions is that before any commitment is made for the construction of a major new generating station, after the completion of the Darlington Nuclear Station in 1993, every effort be made to: maximize as a high priority the capabilities of the existing generating and transmission system; identify and exploit the potential of demand management; aggressively promote private generation; and develop the remaining available hydraulic sites in an environmentally acceptable manner.

During the course of this review the Committee has also come to understand that traditionally by international standards Canada and Ontario have not been the most efficient users of electricity. This has probably been due to the perception that electrical energy supplies are virtually unlimited and available for development and sale to users at low costs. The Committee believes that this perception and attitude should change for the future. Other nations have prospered by making more efficient and effective use of their more limited and costly energy resources.

In addition to focussing on these strategic matters, this report also addresses a variety of other electrical power system planning issues which the Committee believes are important. These include such matters as the approval process for major generation projects, the regulation of Ontario Hydro, forecasting and dealing with uncertainty, economic issues and Ontario Hydro, power purchases and power exports.

The Committee unanimously believes that the recommendations within this report will serve as a valuable guide for establishing future demand/supply planning priorities and improvement in the process of power system planning for Ontario. The Committee sincerely hopes that these recommendations will be given careful consideration by the government, particularly the Ministry of Energy, and Ontario Hydro.

The Committee Hearing Process

Following two days of organizational meetings in late February and early March 1988, the Committee then held six weeks of public hearings. These comprised two weeks of background briefings primarily by Ontario Hydro on DSPS from August 2 to 12, and four weeks of public hearings on DSPS from September 12 to October 6. Except for one day of travel to hear delegations in Elliot Lake (September 23, 1988), all of the Committee's hearings were held at the Ontario Legislative Building in Toronto. In Elliot Lake, the Committee heard from local municipalities, the business community and organized labour who passionately described the importance of employment opportunities and the stimulus for social development provided to that region of Northern Ontario by nuclear generation and its use of Ontario uranium. In addition to these public hearings, the Committee also held four days of in camera meetings between November 28, 1988, and January 9, 1989, to discuss and finalize this report.

The Committee received extensive background and briefing materials from senior staff of the Legislative Research Service. It also commissioned background analyses from 11 consultants. Passmore Associates International (Ottawa), consultants in new energy sources/private power development, assisted in the identification of potential witnesses, questioning of Ontario Hydro and others, and review of technical materials presented to the Committee by Ontario Hydro. Sixteen expert witnesses and 27 interested groups also appeared before the Committee. Appendix D contains a list of witnesses who appeared before the Committee. As noted in Appendix E - Exhibit List, the Committee also received some 120 written submissions.

The Committee also received input and testimony from the Ministry of Energy including an appearance before the Committee on August 2, 1988, by Robert Wong, Ontario Minister of Energy. The Ministry of the Environment and officials involved in the "Interministerial Review" (Review by Government Ministries of Ontario Hydro's Draft Demand/Supply Planning Strategy, Report to the Minister of Energy, July 1988) and the Electricity Planning Technical Advisory Panel (EPTAP) also appeared before the Committee (see Appendix A).

Other notable witnesses to appear before the Committee included: Mr. Ola Ullsten, Swedish Ambassador to Canada, who described his country's decision to phase out nuclear power; Dr. John Ahearn, Vice President and Senior Fellow, Resources for the Future (Washington, D.C.) and former Chairman of the U.S. Nuclear Regulatory Commission who provided a review of international perspectives and experience on nuclear power; and Dr. Kenneth Hare, Chairman, Ontario Nuclear Safety Review (February 1988) and Chairman, Climate Program Planning Board of Canada who highlighted the findings of the safety review and discussed the "greenhouse effect," and the implications of observed global warming to the desirability of fossil fuel combustion for generation of electricity in the years ahead.

The Committee was also impressed by the diligence and dedication of Ontario Hydro staff members who appeared before or assembled background material for the Committee. The Committee appreciates the appearances before it by Mr. Robert Franklin, Chairman and President, Ontario Hydro. The Committee was also most grateful and impressed by the role played by Mr. Lorne McConnell, Hydro's Vice-President of Corporate Planning, in his extensive testimony before and attendance at the Committee hearings.

The Committee wishes to thank each of those who took the time to appear before or make written submissions to the Committee. Members were impressed by the quality of the contributions. Volume 2 contains the "Energy Committee Hearing Summary," which provides the reader with an appreciation of the broad range of viewpoints expressed on DSFS. This Summary was used by the Committee during its in camera deliberations leading toward the drafting of this report.

Acknowledgements and Concluding Remarks

The Committee wishes to acknowledge the conscientious and valuable support of staff. Tannis Manikel, Clerk, gave every consideration to ensure that individuals and organizations were allowed the opportunity to present their viewpoints or make written submissions to the Committee. Jerry Richmond and Lewis Yeager of the Legislative Research Service served as

the Committee's Research Officers and provided necessary background information and prepared the "Energy Committee Hearing Summary." At the Committee's direction the researchers drafted this report.

In summary, Committee Members appreciate that the process of planning a reliable and economic electrical energy system is a complex undertaking which is of vital importance to the economic and social well-being of Ontario. The Committee, based upon thoughtful discussion, sincerely believes that its recommendations provide worthwhile direction to this planning process and looks forward to a timely response to these proposals and action by the government.

THE EXISTING GENERATING SYSTEM

Ontario Hydro Priority Strategic Direction:

In the 90s, your electricity supply will largely be met with the Power System which is operating today or already under construction. However, we do have a lot of work to do in rehabilitating aging hydro stations, aging transmission and aging thermal stations. We also must make sure the nuclear stations achieve their full economic lifetime.

Note: This statement is extracted from Draft Demand/Supply Planning Strategy, Ontario Hydro Report 666B SP, September 1988, which is reproduced in Appendix B.

Commentary

Based upon testimony before the Committee and its subsequent discussion of this matter, there was general support and acceptance of the important role to be played by the existing generating and transmission system in the current and future power supply for the province.

The existing Ontario Hydro generating system, with the completion of the Darlington Nuclear Generating Station, will have a total installed capacity of some 32,400 MW and a load meeting capability of 26,000 MW while making allowance for a planning reserve margin (see Appendix C - Glossary).

Ontario Hydro's generating system consists of 81 generating stations with 68 hydraulic plants, 8 fossil stations (with 6 in operation and 2 mothballed), and 5 nuclear facilities, of which 4 are operational and 1 is under construction. The bulk transmission system, which spans the

province, has a length of some 27,150 circuit kilometres. By 1993, with the completion of Darlington, hydro-electric capacity will make up 20 percent of the total capacity with the comparable figures for nuclear being 43 percent and fossil generation 37 percent. However, in terms of energy production, nuclear is expected to supply 61 percent of electrical energy needs by 1993. The comparable contributions of hydraulic and fossil will be 22 percent and 17 percent respectively.

The Committee accepts and understands that this existing bulk electrical energy system is a valuable public asset, essential to the economic well-being of the province. As stated by Ontario Hydro in its submissions to the Committee:

. . . [the] existing and committed supply facilities will be the backbone of the system to meet the province's electricity needs well into the next century.

The same applies to the transmission lines and stations and the distribution facilities needed to move the electricity from the generating stations to our customers.

(Ontario Hydro, "Presentation 11.5E - Existing Plant," August 1988, p. 5.)

However, the Committee appreciates that there is room for improvement in the existing system to improve the reliability of power supply to certain communities and areas of the province. In its submission to the "Interministerial Review" the Ministry of Northern Development and Mines, for example, indicated that some northern "single feed" communities (i.e., where one powerline serves the community) have concerns regarding the security of supply. Remote communities in the far north of the province which are not connected to the transmission grid have concerns about their cost of power and possible future connection to the grid. In addition, a variety of industrial concerns such as Inco and Unisys Canada, an information processing company, expressed concern regarding the continued reliability of the power supply ("Energy Committee Hearing Summary," p. 9 in Volume 2). The upgrading of the existing power supply and distribution system could act to improve service or reliability to certain parts of the province and to certain industries.

The Committee, in its consideration of the role of the existing system, unanimously believes that a high priority should be placed on maintenance, upgrading and refurbishment. Older plants may also be preserved for use in contingency or emergency situations. Every effort

should be made to produce more power from the existing system, while placing the highest priority on protection of the environment. In this regard, the Committee believes that an environmental audit should be conducted of the existing generating system to ensure that environmental standards are equal to or superior to standards elsewhere and it should be reviewed in a public forum. The opinion was expressed that as a crown corporation, Ontario Hydro should "lead" and not just follow Ministry of the Environment requirements with regard to atmospheric emissions from fossil stations and other environmental protection and enhancement measures.

Among the specific issues that such an audit should investigate are:

- the development of a firm program and timetable for the installation of scrubbers, or other pollution abatement technologies, at Ontario Hydro's coal-fired stations. It is the Committee's understanding that these stations will continue to be required to meet a portion of the province's electrical energy requirements and peak power requirements in particular.
- the feasibility of constructing an IGCC or integrated gasification and combined cycle plant (whereby pulverized coal is converted to coal gas and the gas then enters a combustion turbine to produce electricity and the waste heat is also used to produce electricity) in Ontario to demonstrate the viability of this "clean coal" technology.
- the role that natural gas, which is perceived to be a relatively clean fossil fuel, might play in meeting a portion of the immediate or medium-term power requirements of the province, pending resolution of the issues of long-term supply and stability in price. Analysis might also be conducted of the possibility of repowering some existing fossil stations with natural gas. However, the Committee believes that the possible expanded use of natural gas to generate electricity in Ontario should in no way adversely affect the supply of natural gas available for home heating in Ontario.
- the refurbishment and modernization of hydraulic installations which make use of renewable resources. In this regard, the Committee believes that the capacity and service lives of this original backbone of the bulk generating system can be extended to operate well into the next century.
- the potential for safely extending the service lives of the existing CANDU nuclear stations. Due to the key role which these play in meeting baseload power requirements, ongoing research in this regard could pay significant future dividends to all consumers of power in Ontario.
- the general upgrading of all components of the existing generation and transmission system to improve quality of service and reliability.

In advocating this priority to be placed on the maintenance and improvement of the existing system, the Committee recognizes that in many cases the environmental impact and approval process may be less comprehensive than that for the development of new facilities. In addition, transmission lines and corridors are also usually readily available as part of the existing transmission network.

Recommendations

1. In the planning for and meeting of Ontario's electrical energy requirements, Ontario Hydro and the government should place a high priority on the maintenance, upgrading and refurbishment of the existing generating and related transmission system consistent with the highest standards of environmental protection.
2. An environmental audit should be undertaken by Ontario Hydro of the existing generating system and submitted to the Ministry of Energy for review.
3. The environmental audit should investigate:
 - a. the development of a firm program for the installation of scrubbers or other appropriate emission abatement technologies at Ontario Hydro's coal-fired generating stations.
 - b. the feasibility of constructing an integrated gasification and combined cycle (IGCC) plant in Ontario to demonstrate the viability of this "clean coal" technology.
 - c. the role that natural gas might play in the short-term and medium-term in meeting a portion of Ontario's power requirements. The feasibility of repowering some existing fossil stations with natural gas should also be assessed.
 - d. the refurbishment and modernization of older hydraulic stations. This is desirable since hydraulic installations utilize a renewable resource.
 - e. research programs or measures which may serve to safely extend the service lives of existing nuclear stations.
 - f. the general upgrading of all components of the existing generation and transmission systems to improve reliability and quality of service.

DEMAND MANAGEMENT

Ontario Hydro Priority Strategic Direction:

To meet the future, we are involved in an aggressive demand management program to minimize the growth. This involves peak shifting programs and improved electrical use efficiency. Close cooperation is needed between Ontario Hydro, the municipal utilities, all customers and the electrical industry. Although demand management is not new, we are proposing a major increase in its intensity.

Note: This statement is extracted from Draft Demand/Supply Planning Strategy, Ontario Hydro Report 666B SP, September 1988.

Commentary

Policy Framework

The Committee heard extensive testimony from a broad range of witnesses regarding the amount of potential energy savings that is technically achievable in Ontario. Some of these felt that Ontario Hydro had underestimated the potential for demand management, while others suggested that Hydro's projections of energy savings were too optimistic and feared that such assumptions might delay the implementation of needed new generation supplies and result in energy shortages.

However, the Committee feels that regardless of the exact amount of demand management that is available, the potential for energy savings is considerable. The need for early implementation of an effective provincial demand management strategy is the key conclusion which emerged from the Committee's consideration of this matter.

In its Draft Demand/Supply Planning Strategy, Ontario Hydro noted on page 10-8:

The amount of demand management that can be achieved at any particular level of incentives is uncertain. Reducing this uncertainty could defer the need to start planning for supply facilities. Early market research and implementation of demand management may help resolve this uncertainty, as well as provide an infrastructure and human resource base for increased efforts if needed.

The Committee noted the urgent need for measures to reduce the uncertainty surrounding demand management measures. The Municipal Electrical Association suggested that demand management market demonstrations be increased and accelerated in order to reduce this uncertainty ("Energy Committee Hearing Summary," p. 45). A brief from the Faculty of Engineering at the University of Windsor also indicated that the uncertainty surrounding the implementation of demand-side options in most utilities can largely be eliminated by the use of demonstration projects and pilot tests, and noted that experience in the United States indicates that while uncertainty will always remain, data gathering and direct program experience can narrow the utility's range of uncertainty significantly ("Energy Committee Hearing Summary," p. 39).

In the opinion of the Committee, there is an immediate need for market research and the initiation of conservation pilot projects to reduce uncertainty about demand management within Ontario Hydro and among its customers. The compilation of this information, however, need not delay the immediate implementation of an aggressive demand management policy.

The Committee is unsure whether vigorous demand management measures will, in fact, preclude the need for additional new generating capacity, since economic growth and many other factors play major roles in energy consumption patterns. The Committee does feel that Ontario's utilization of electricity should become as efficient as is economically possible.

The Ministry of Industry, Trade and Technology, in its contribution to the Interministerial Review of DSPS ("Energy Committee Hearing Summary," p. 34) noted that it is important to acknowledge that there are other external benefits such as regional development or industrial restructuring which should be included in the evaluation of costs and benefits of alternative options. The Municipal Electrical Association ("Energy Committee Hearing Summary," p. 36) indicated that demand management has the shortest lead time between when dollars are spent and when benefits show to the system, but cautioned that large contributions from demand management would likely only materialize over a long period of time.

Essentially, the Committee concludes that measures are needed to maximize conservation in Ontario in the next 20 year period and that we need accurate studies and aggressive programs in order to get on with the job. Some Members noted that higher electricity prices might be the only sure method of stimulating conservation in a province where energy has traditionally been comparatively inexpensive. For this reason, the Committee feels that there is a great need for additional effective educational and promotional efforts related to the need for conservation throughout Ontario society. As well, the Committee concludes that the Ministry of Energy and Ontario Hydro must evolve from largely technical and planning roles toward an aggressive advocacy stance which will promote demand management objectives and techniques to major consumer groups, municipalities, local utilities and large institutional users of electricity, as well as to the public at large.

In order to better define the assessment of conservation opportunities in the province, the Committee supports the recommendation of the Technical Advisory Committee ("Energy Committee Hearing Summary," p. 45) that Ontario Hydro and the Ministry of Energy develop a

complete set of realistic conservation supply functions for incorporation in their planning process. First attempts at developing electricity conservation supply curves for Ontario's residential, commercial and industrial sectors, which were prepared for the Ministry of Energy, were described to the Committee by Marbek Resource Consultants Ltd. on September 15, 1988. These should be further improved using the resources of Ontario Hydro and the Ministry of Energy to the point that they can be used as effective planning tools. As well, the Committee agrees with the Association of Major Power Consumers in Ontario ("Energy Committee Hearing Summary," p. 45) that Ontario Hydro should develop a monitoring and post-audit system to determine the amounts of demand management achieved. These two elements would make the electrical planning process more business-like and more understandable to the public and government reviewers, and should assist in reducing the uncertainty surrounding some aspects of demand management.

The Committee also heard that the Power Corporation Act precludes Ontario Hydro from making incentive payments to achieve demand management improvements (see Section on Recommendations of Previous Select Committee on Energy). The Technical Advisory Committee ("Energy Committee Hearing Summary," p. 51) noted that to achieve high penetration rates in each sector, it will probably be necessary for Ontario Hydro to offer financial assistance at levels up to the total cost of each conservation measure. The long payback period associated with energy conservation measures also appears to be a barrier to successful implementation of demand management measures. Testimony from William Peden of Energy, Mines and Resources Canada ("Energy Committee Hearing Summary," p. 55) indicated that using conventional economics, many energy-efficient technologies require more than the two or three year payback generally stipulated for capital investment by industry.

Clearly, in the Committee's opinion, there is a need for the Ministry of Energy and Ontario Hydro to place a priority on identifying such barriers, and through education, promotion or policy initiatives, to ensure that these impediments are significantly reduced.

Lorne McConnell of Ontario Hydro testified before the Committee on October 4, 1988, that Ontario Hydro's strategy gives high priority to demand management, and that the Board, Chairman, President and senior management are fully committed to achieving demand management results. The Committee also appreciates the point made by Mr. McConnell ("Energy Committee Hearing Summary," p. 47) to the effect that Ontario Hydro cannot do demand management alone and that to be effective, such programs may involve the participation of the Ministry of Energy, municipal utilities, consumers, and the private sector.

Recommendations 4 to 7 address these issues.

Energy Efficiency

The Committee heard a broad range of evidence concerning many aspects of energy efficiency in buildings, appliances, industrial processes and municipal services. It is clear that there is a considerable amount of electricity which could be diverted to better uses through improvements in the ways in which Ontarians use power. As noted earlier, Canada appears to be a relatively inefficient user of electricity and energy in general compared with most other countries where energy sources are often in short supply and are generally more expensive. The Committee concludes that more efficient use of electricity is in itself a desirable goal for Ontario, and that a broad range of benefits will result from a reduction in wasted energy resources.

There are differing opinions on the best ways in which to achieve greater energy efficiency. The Municipal Electrical Association ("Energy Committee Hearing Summary," p. 33) feels that demand management programs should continue to be optional. Several witnesses spoke of the value of incentives for achieving energy savings. Mr. McConnell of Ontario Hydro noted in his testimony on October 5, 1988, that the Northwest Power Planning Council in the United States was able to reduce its target for conservation because some of the savings they expected to have to promote will now be achieved through their federal government's introduction of higher efficiency standards for buildings and appliances. The Committee has come to appreciate the important contribution that such standards might make to implementing an effective demand management strategy.

With regard to specific areas for potential improvements in energy efficiency, home appliances, tools, and heating/cooling equipment were discussed by several witnesses. Mr. Ted Muffit, Vice President of Marketing with W.C. Woods Ltd., a major Canadian manufacturer of several lines of energy-efficient electrical freezers sold in Canada and the United States, told the Committee that energy conservation is at the bottom of consumer choice factors based on sales experience. For example, high-efficiency freezers are selected by most purchasers because of the higher overall quality of manufacture needed to make them energy-efficient rather than for any specific benefits related to energy conservation ("Energy Committee Hearing Summary," p. 47).

The Committee also heard numerous other examples of barriers to greater use of energy efficient appliances and heating/cooling systems in residential settings. The Ministry of Housing, in its contribution to the Interministerial Review of DSPS ("Energy Committee

Hearing Summary," p. 54), noted the difficulties arising from situations in which the individual who saves electricity does not directly benefit.

In the part of the strategy dealing with demand management, the Ministry of Housing supports attempts to encourage responsible electricity consumption. In bulk metered apartments, there is no obvious way to make tenants accountable for their individual electricity consumption. The draft strategy suggests that tenants could be encouraged to conserve through a benefit sharing plan. The Ministry of Housing doubts that this proposal will provide a workable remedy. An additional impediment to energy efficiency in bulk metered apartments is the lack of incentive for the landlord to introduce conservation measures, since any gains can be neutralized by irresponsible consumption of some tenants. In such cases, the feasibility of promoting measures, like high efficiency lighting and appliances and energy-efficient hot water systems, where savings accrue to the landlord regardless of a tenant's behaviour, should be examined closely by Ontario Hydro. In individually metered apartments, landlords are often unwilling to invest in measures where the benefits accrue only to the tenant. In such cases, the Ministry suggests that Ontario Hydro offer financial incentives to introduce conservation measures, with some of the landlord's capital costs being recovered through the present Rent Review process.

The Committee, therefore, concludes that there is an important role for energy conservation standards for appliances, lighting, heating/cooling equipment, and other household electrical products used in Ontario. This approach should also be applied to commercial and industrial equipment. Committee members feel that regulations under the Energy Efficiency Act, 1988 should be as stringent as any standards in North America. The Committee understands that the United States will be adopting California's energy efficiency standards in 1992, and is concerned that when these come into effect, less efficient appliance models may end up in Ontario if we do not have comparable standards in place. Similarly, Ontario manufacturers might be better able to compete in North American markets with comparable energy-efficiency requirements in effect.

There was also extensive discussion of energy-efficient lighting, particularly in terms of potential energy savings by municipalities and other large consumers of electricity. Mr. Peden of Energy, Mines and Resources Canada testified that lighting is one of the largest electricity

loads in Ontario and offers some of the largest potential savings ("Energy Committee Hearing Summary," p. 36). Mr. Peden noted that lighting represents more than 35 percent of Ontario's total industrial and commercial building electricity consumption. The Committee also heard that some municipalities have realized substantial reductions in electrical consumption by installing energy-efficient street lighting.

As with home appliances, the Committee agrees that energy efficiency standards for lighting must be comprehensive and stringent and they must be implemented as soon as possible. The Committee also prefers the implementation of these measures to be compulsory through regulation rather than be largely voluntary or incentive-driven. The Committee heard that one barrier may be the current lack of availability of energy-efficient products in stores and therefore sees important roles for the Ministry of Energy and other government ministries in effectively promoting and coordinating the switch to energy-efficient alternatives.

The Committee also concluded that it is desirable to greatly increase electrical energy efficiency in new and existing residential, commercial and industrial buildings. Members are satisfied that considerable progress has been made in energy-efficient single-family housing, and that programs such as R-2000 have facilitated the spread of the required design and building skills throughout the home construction industry. There appear to be many additional opportunities for improvements in residential construction, as well as in commercial buildings and industrial construction, and for retrofitting existing buildings. Lower operating costs would be a benefit to owners, and the Committee heard from representatives of the energy service industry that considerable expertise is now available to building owners to help plan and finance energy management strategies for institutions, factories and commercial buildings.

Recommendations 8 to 11 address energy efficiency.

Municipal Utilities

The Committee heard a considerable body of testimony regarding the roles and concerns of the municipal utilities in Ontario with respect to electrical power planning. In a sense, these utilities in most of the province act as retailers of electricity which is supplied by Ontario Hydro, the wholesaler.

Some Members were struck by the apparent lack of incentives for municipal utilities to encourage demand management, since once their distribution facilities are in place, they appear

to benefit by selling as much power as possible. The Committee concluded that there must be an important role for municipal utilities and relevant incentives if significant improvements in demand management are to be achieved in Ontario.

The Association of Major Power Consumers in Ontario noted ("Energy Committee Hearing Summary," p. 42) that the interests of Ontario Hydro and municipal utilities are not necessarily congruent, especially with respect to interruptable load, and that cooperation between the two may be easier said than done in a situation where each has valid interests to defend. While the Municipal Electrical Association testified that municipal utilities should maintain their right to implement demand management programs that best serve their customers' needs ("Energy Committee Hearing Summary," p. 42), there was considerable Committee discussion of a possible future need for demand management targets for these utilities.

The Markham Hydro Electric Commission told the Committee that it is convinced and has demonstrated that demand side initiatives properly presented and explained to the consumer will be accepted if they are cost effective ("Energy Committee Hearing Summary," p. 42). The Commission recommended that incentives be made available to individual utilities for "buying in" to such programs. Etobicoke Hydro pointed out that while it possesses a highly competent marketing, engineering and meter reading staff, in order for the municipal utilities to be strong participants in any proposed implementation of demand management options, it is particularly important that sufficient levels of staff expertise in the demand management options side be made readily available to the medium and smaller utilities ("Energy Committee Hearing Summary," p. 43). A recommendation that large numbers of Ontario Hydro staff with skills in demand management be seconded to utilities that currently lack the expertise to implement demand initiatives was also presented by Etobicoke Hydro.

Mr. H. Palmer of Ontario Hydro testified on October 5, 1988, that there are 20 municipal utilities in Ontario that take 90 percent of the load while the other 300 make up 10 percent. These 20 large-load utilities were described as being largely within 50 miles of Toronto, so that any proposed energy savings would likely primarily come from them.

Recommendations 12 and 13 relate to municipal utilities.

Recommendations

Policy Framework

4. The Ministry of Energy should immediately establish programs using the best available conservation supply curves to identify sectors with the greatest potential for demand management and set priorities for action in a specific two year implementation timetable.
5. The Ministry of Energy should substantially increase its educational and promotional programs related to demand management.
6. No new major Ontario Hydro supply options should be approved until the Ministry of Energy is satisfied that the uncertainty regarding the amount of demand management which can be achieved is reduced by means of effective market research and studies of implementation feasibility.
7. Ontario Hydro and the Ministry of Energy should develop an effective monitoring and post-audit system to determine the amounts of demand reduction being achieved by their programs.

Energy Efficiency

8. The Ministry of Energy should develop a compulsory program for energy-efficient street lighting for all Ontario municipalities to be implemented over a five year period.
9. The government should revise the Ontario Building Code to substantially increase energy efficiency standards for new residential, commercial and industrial buildings.
10. The Ministry of Energy and Ontario Hydro should develop additional programs to improve the energy efficiency of existing residential, commercial and industrial buildings.
11. Regulations should be implemented under the Energy Efficiency Act, 1988 to provide stringent standards for electrical appliances, heating/cooling equipment and other home electrical apparatus which are compatible with the 1992 regulations being implemented in the United States.

Municipal Utilities

12. The Ministry of Energy and Ontario Hydro should develop compulsory demand management programs, including appropriate incentives, for all municipal utilities in the province.
13. The Ministry of Energy and Ontario Hydro should train staff in demand management techniques who would be made available to municipal utilities and other major power consumers to ensure the timely and effective implementation of provincial demand management programs.

INDEPENDENT GENERATION AND COGENERATION

Ontario Hydro Priority Strategic Direction:

We are also proposing to achieve part of the needed supply by purchasing power from private developers. We will be particularly encouraging renewable generation such as small hydro and wood waste. Also, we will favour fossil generation which employs high efficiency cogeneration.

Note: This statement is extracted from Draft Demand/Supply Planning Strategy, Ontario Hydro Report 666B SP, September 1988.

Commentary

The Committee heard a range of opinions and suggestions relating to future roles for independent (private) power generation and cogeneration in Ontario. Mr. H. Palmer of Ontario Hydro testified that with the recent establishment of a non-utility generation division, the target for private generation had been increased from 330 MW to 1000 MW by the year 2000 ("Energy Committee Hearing Summary," p. 56). Mr. Steven Diener, an energy consultant, told the Committee that by the year 2000, depending on the choice of investment criteria, 1300 to 1700 MW of cogeneration capacity are financially feasible in the industrial and buildings sectors. These amounts are highly sensitive to buy-back rates ("Energy Committee Hearing Summary," p. 57).

The Ministry of Energy provided the Committee with an overview of the benefits of private power:

In addition to conservation, independent generation does well when judged against the three basic criteria of security, reasonable cost and environmental compatibility. This option offers diversity and increases planning flexibility. Independent generation also encourages the more efficient use of indigenous resources, fosters the development of a new industry in Ontario and can offer power where it is needed with short lead times. The Ministry has a long-standing policy of actively supporting small hydro and other forms of independent generation.

("Energy Committee Hearing Summary," p. 57).

In its examination of DSPS for the Interministerial Review ("Energy Committee Hearing Summary," p. 58), the Ministry of Northern Development and Mines indicated it:

. . . welcomes the strategy's support for independent generation. This should encourage the development of small hydro as well as cogeneration which add to the resiliency of the overall system and facilitate entrepreneurship. While supporting the principle that Ontario Hydro pay the full avoided cost for purchased power, other options include: making it compulsory for Ontario Hydro to "wheel" power between independent generators and communities or industrial customers; and standard and generous buy-back rates for small producers. Hydro should also be required to exercise its right of first refusal on hydro sites within a reasonable amount of time or release such sites to private development.

Committee Members concluded that there is a very important role for independent generation and cogeneration in Ontario. The Committee heard, however, from several witnesses that there are real or perceived barriers which could affect the feasibility of private power. Several of these were summarized by the Electricity Planning Technical Advisory Panel in its Review of Ontario Hydro's Draft Planning Strategy ("Energy Committee Hearing Summary," p. 59):

Based on experience in other jurisdictions, we believe Hydro's approach to independent generators is set out too narrowly and specifically. Hydro has indicated as a strategic principle that it will restrict standard contracts to independent generators under 5 MW. A less restrictive independent power policy would in our view reveal much greater potential for independent generation as an alternative supply option. We focus on this area not only because of its potential importance but also because we recognize that Hydro has limited experience with its possibilities.

In our view it would be more effective in the short term to set a standard price and contract with clear stipulations and then let the private sector see what can be done to meet the conditions. Hydro currently has set standard buy-back rates for producers under 5 MW. Standard rates and contracts should be established for all producers. The contract and pricing terms should be given policy review by government and independent regulatory review rather than being set unilaterally by Hydro as is done at present. The prices

should be provided for a specific amount of power and updated for new producers when that amount of power has been committed. If, as has occurred in other jurisdictions, a large number of potential producers come forward for the initial offer, Hydro could reconsider the potential for independent power production. As an independent generation industry begins to develop, a bidding mechanism could be instituted to recover the benefits from competition for ratepayers and society as a whole.

Representatives of Multistream Power Corporation, which operates and finances independent generation projects, testified that the present Hydro buy-back rate is artificially low compared with the cost of new generation by Hydro, and that Ontario needs a full avoided cost buy-back range (about six to eight cents per KWH) to bring venture capital into the industry ("Energy Committee Hearing Summary," p. 61). Multistream Power suggested that there would be a lot of power available at such a price and that the province would then be in a position to move toward competitive bidding among proponents once the industry is better established. From its point of view, Multistream Power indicated it was being cautious about expansion because it needs a stable government policy environment for business planning.

William Marcus, an energy consultant, suggested to the Committee that encouraging independent generation through full avoided cost prices and standard contracts is important not only to bring resources on line, but to acquire information and experience ("Energy Committee Hearing Summary," p. 58). The Municipal Electrical Association, however, cautioned that independent generation should be encouraged but not at the expense of higher customer rates ("Energy Committee Hearing Summary," p. 62). Similar sentiments were echoed by the Canadian Electrical Association:

Concurrence expressed with encouragement of independent generation and suggestion that the experience of utilities in the U.S. with benefits and pitfalls of independent generation be carefully analyzed and factored into Hydro's future planning. It is important that the purchase of independently produced energy be conducted in such a way as to provide primary benefit to the consumer. The principle of not purchasing independent power above avoided cost is appropriate, but sometimes difficult to calculate in practice. Nevertheless, every effort should be made to avoid unwarranted subsidization of independent generation by consumers.

("Energy Committee Hearing Summary," p. 65)

The Committee notes that a previous Select Committee on Energy recommended in 1986 several measures related to independent generation. These included:

- The Minister of Energy should request the Ontario Energy Board hold a public hearing to determine the price which best reflects the value of parallel generation to the system, and to determine the desirable amount of parallel generation that could be added to the system within the current planning horizon.
- The Ministry of Energy should develop and publish detailed plans for parallel generation options including:
 - specific targets;
 - financial and contractual arrangements;
 - the role of Ontario Hydro in promoting parallel generation;
 - additional research, development and the demonstration programs needed; and
 - information and marketing efforts.

The Government must direct Ontario Hydro to incorporate these plans into its own annual resource plan.

("Energy Committee Hearing Summary," p. 59)

The present Committee is in general support of these recommendations and urges the Ministry of Energy to actively consider them. Further comments on these and other recommendations of the previous Select Committee appear in a later section of this report.

The Committee is pleased to note that Ontario Hydro's strategy calls for it to promote the development of economic non-utility generation in the Ontario community; and it calls for Ontario Hydro to pay up to but not exceed full avoided cost (L. McConnell, Ontario Hydro, October 5, 1988).

Elaborating on Ontario Hydro's views, Mr. McConnell provided the following overview to the Committee on October 5, 1988:

Both generation and transmission are included in the determination of avoided cost. Obviously independent companies or persons in their desire for profit and opportunity, want the value for avoided cost to be made as high as possible. Ontario Hydro consumers are best served by the avoided cost being as accurate as possible.

The strategy calls for Ontario Hydro to encourage the development of economic non-utility generation and to pursue the maximum amount available and needed. Are there any practical limits to the amount that can be expected? The same forms of primary energy are available to non-utility organizations as are available to Ontario Hydro. That is oil, gas, coal, peat, wood, waste, hydro, wind, solar and so on. Cogeneration, which is an efficient process, refers to any primary energy being converted to both steam and electricity. We expect the majority of economic non-utility generation in Ontario to be in the form of cogeneration in which gas is used to generate steam and electricity. This is inherently limited to major industries and major commerce using large amounts of steam.

. . . If a utility has high costs and therefore high rates, then demand management and non-utility generation appear more attractive. On the average, Ontario Hydro costs are lower than those in the United States and we expect our avoided cost value will continue to be low.

Janice Hamrin, Executive Director of the Independent Power Producers Association in the United States and a member of the Ministry of Energy's Electricity Planning Technical Advisory Panel, offered the following views to the Committee on American (particularly Californian) experience with private power ("Energy Committee Hearing Summary," pp. 61-62):

- utilities must plan for success in the event that there is a greater potential supply than anticipated;
- a cap must be placed on the amount of power that will be purchased at a given price;
- a successful program needs regular review;
- standard contracts were important;
- regulatory stability was important;
- outside participation and expertise was valuable;
- one needs a long-term perspective when planning;
- back-up and maintenance power rates were important;
- the start-up phase was important and different from the remainder of the program;
- roles of regulators changed as the program developed;
- much attention needed to be placed upon integration of independent power into the power plan and the existing system.

Based upon the information provided, the Committee concluded that policy initiatives are needed to derive benefits from an independent power generation industry which is competitive with alternative public sector generation options. While the Committee did not feel it had the expertise or resources to determine the price that should be paid by Ontario Hydro for private power, it did see the need for specific initiatives to overcome this and other barriers to development of independent generation and cogeneration capacities in the province. The Committee's recommended mechanism is to strengthen the mandate and powers of the Non-utility Generation Advisory Council of the Ministry of Energy to recommend pricing, policy and technical initiatives to address barriers to the successful implementation of a greater contribution from private power.

The Committee emphasized in its deliberations that provincial environmental protection and enhancement goals should not be compromised by the development of independent generation and that particular care would be required to ensure a timely yet effective approvals mechanism. The Committee also recognized that private power proposals may vary considerably in characteristics and scope and that regulation may prove to be a challenge in the short term. Particular effort will be needed to effectively co-ordinate the existing regulatory responsibilities of provincial Ministries in light of the variety of potential proponents and projects and the expected increase in the level of generating activity.

Recommendations

14. The government should strengthen the Non-utility Generation Advisory Council to identify and eliminate barriers to a successful independent generation industry in Ontario. This body should have representation from the Ministry of Energy, the Ministry of Industry, Trade and Technology, Ontario Hydro, the Independent Power Producers' Society of Ontario and the financial sector and should report to the Minister of Energy annually.
15. The government should initially establish a benchmark price to be paid for independently generated power which will attract sufficient additional generation capacity to ensure the establishment of a healthy private generation sector.
16. Ontario Hydro should pay up to "Full Avoided Cost" for independently generated power subject to policies established by the Ministry of Energy and its Non-utility Generation Advisory Council regarding the location and amount of generation required.
17. The government should establish a body with representation from the Ministry of the Environment, the Ministry of Energy, the Ministry of Natural Resources and Ontario Hydro to recommend and implement preferred regulatory approaches for defined categories of independent power generation facilities which will ensure timely approval of new generation capacity while achieving provincial environmental protection and enhancement goals. It should present its findings within one year of its establishment.

REMAINING HYDRAULIC POTENTIAL

Ontario Hydro Priority Strategic Direction:

We propose to develop all remaining economic hydro-electric generation in an orderly manner.

Note: This statement is extracted from Draft Demand/Supply Planning Strategy, Ontario Hydro Report 666B SP, September 1988.

Commentary

The Committee recognizes that hydro-electric power, and particularly the harnessing of the Niagara and other major rivers, served as the original source of electrical power in Ontario. However, based upon the presentations and submissions of Ontario Hydro and other witnesses, the Committee understands that there is only a limited number of significant remaining hydraulic sites available for economic development or redevelopment. As noted by Ontario Hydro in its presentation to the Committee, there are 17 significant economic hydraulic sites with a total capacity of 2750 MW which remain for development or redevelopment over the next 20 years. The utility is actively studying the proposed Little Jackfish development and the Mattagami extension (both in Northern Ontario) plus the expansion of the hydraulic installations at Niagara. These three projects account for some 1000 MW of the available hydraulic potential among the available sites.

Since hydraulic generation makes use of a renewable resource, utilizes engineering and manufacturing capabilities primarily based in Ontario and Canada and in many instances can be designed to minimize adverse environmental impacts, the Committee is in support of the above strategic direction. However, the Committee also recognizes that some new hydraulic installations may have a potential to result in a profound environmental impact upon the affected watersheds and every effort must be made to ensure that such projects are developed in an environmentally appropriate manner. This will require efforts to minimize adverse local environmental and social impacts while at the same time, wherever possible, providing positive local economic benefits and employment opportunities. The Committee also supports the orderly development of the various sites to minimize the socio-economic impacts on local communities and smooth the flow of work to engineering firms and contractors.

In its submission to the Committee, the Consulting Engineers of Ontario advocated that "if some of the several hundred megawatts [of] available [hydraulic capacity] do not meet Hydro criteria, consideration should be given to releasing these for private sector development or exploring innovative joint development possibilities" (Exhibit 57, p. 57, in Appendix E). In its submission to the "Interministerial Review" the Ministry of Natural Resources indicated that:

Should Ontario Hydro determine that it does not wish to develop a specific site, the Ministry would consider releasing the site to the private sector for development (p. 64).

The Committee, in keeping with its goal of promoting the development of private generation in Ontario, supports the "release" of such sites to the private sector. Such private developments, however, would have to respect appropriate environmental protection and enhancement policies and standards.

Recommendations

18. Remaining economic hydro-electric sites should be developed in an orderly and environmentally appropriate manner. In those instances where Ontario Hydro may not be interested in developing particular sites, these locations should be released to independent generators for possible development.
19. Available hydraulic sites should be developed to maximize positive economic and social impacts to the Ontario and Canadian economies in an orderly fashion. Such developments should also be designed and operated to provide positive local economic spin-offs and employment opportunities, particularly in more remote parts of the province.

OTHER MAJOR SUPPLY OPTIONS

Ontario Hydro Priority Strategic Direction:

We expect there will be a need for further major new supply options such as clean coal, oil, gas and nuclear so it is important to keep these options open. We are also considering purchases from Quebec and Manitoba as a good option. New plants are also required to replace old plant which is economically obsolete [sic].

Note: This statement is extracted from Draft Demand/Supply Planning Strategy, Ontario Hydro Report 666B SP, September 1988.

Commentary

Although the Committee heard a great deal of testimony about various aspects of most major supply options (such as nuclear, natural gas, coal and hydraulic generation and innovative technologies), it does not feel it is yet in a position to give the Ministry of Energy and Ontario Hydro firm direction on preferences for new supply options. This is largely due to the lack of specific information on the relative economic, social and environmental costs and benefits for many of these alternatives.

The Committee sees an urgent need for definitive information in a form which can be readily compared to facilitate future review of the power planning process. For this reason, the Committee concluded that it is not presently possible to rule out any of the major categories of potential electrical supply.

As noted earlier in its discussion of demand management, the Committee recommended that major new supply facilities not be approved until the potential for demand management is better defined by means of effective market research and pilot projects for conservation implementation. The Committee concludes that the government should keep its power options open, and that Ontario Hydro should continue its internal planning activities for a broad range of alternatives.

The Committee also heard divergent testimony on the economic merits of natural gas as a major fuel for electrical generation. While Ontario Hydro screened out natural gas as a candidate supply option at an early stage of its planning process, a number of witnesses appearing at the Energy Committee's hearings suggested that secure supplies at reasonable prices make gas an attractive option for generation in at least the short and medium terms. A subsequent section of this report reviews the gas option in greater detail.

The Committee wishes to emphasize that environmental considerations must play a major role in the selection of new power supply options. It heard from Dr. Kenneth Hare and others concerning the role that carbon dioxide and other emissions from the burning of fossil fuels may have on global warming due to the "greenhouse effect" ("Energy Committee Hearing Summary," pp. 104-105).

The Committee was informed that global targets for reductions in emissions of "greenhouse" gases may restrict the future choices for electrical generation in highly developed jurisdictions such as Ontario. International agreements to limit large combustion sources, particularly those in the public sector, may be a real possibility within the planning period being considered in Ontario Hydro's DSPS.

As well, the Committee is keenly aware of the environmental concerns relating to the major supply options, including: major alterations in aquatic habitats due to hydraulic development; emissions of acid gases and other contaminants from fossil fuel generating stations; and planning for disposal of high level and low level nuclear wastes and decommissioning of nuclear generating stations.

For these reasons, the Committee was of the opinion that Ontario should attempt to keep its energy supply options open until these environmental and other economic and social factors can be better placed in perspective and the extent of contributions from demand management and independent generation become clear. As noted earlier, Ontario Hydro should continue its internal planning for new major supply options to take into account the potential demands which may arise from a wide range of possibilities for economic growth.

Recommendations

20. The Ministry of Energy should compile on a systematic basis the best available information on economic, environmental and social benefits and costs associated with supply alternatives such as power purchases, clean coal technology, natural gas and CANDU nuclear generation which are currently being evaluated in the power planning process.
21. No major potential supply options should be ruled out of the power planning process until the relative benefits and costs have been determined.
22. The environmental implications of candidate supply options must be a major factor in selecting additions to the Ontario power system.

OTHER ISSUES

Overview

During the course of this review which has focussed upon the priority strategic directions of DSPS, a number of other issues, as follows, have arisen which the Committee has chosen to address. While each of these issues is generally relevant to DSPS, they also relate to proposals

for the evolution and change of the power system planning process in Ontario. On those issues where a consensus Committee position emerged, recommendations are put forward. Otherwise, a commentary appears of the Committee discussions of the topic.

Power System Planning Process and Regulation of Ontario Hydro

Commentary

Although the primary focus of the Committee's attention was on DSPS and priorities for the future, the Committee received documentation and heard testimony which touched upon possible reform of the power system planning process in Ontario. Proposals were put forward for modified roles for the Ministry of Energy, Ontario Hydro and the Ontario Energy Board. The Ministry of Energy, for example, in its testimony before the Committee, stated that it has a responsibility for developing policy on electricity planning matters. Ontario Hydro, in turn, is expected to plan its activities within the framework of the government's public policy objectives ("Energy Committee Hearing Summary," p. 4). The Committee is in general agreement with this role structure.

In addition, the Technical Advisory Panel and many other witnesses advocated that ("Energy Committee Hearing Summary," p. 11):

the Ontario government establish by legislation an independent technical agency to conduct in-depth public review of Ontario Hydro's power system plans and to reject those plans, approve them, or approve them in part or with revisions. (Report of the Electricity Planning Technical Advisory to the Ministry of Energy, 1988, p. xii)

The experience of selected jurisdictions with such a process, such as the Northwest Power Planning Council (NPPC) was outlined to the Committee. The NPPC has a responsibility to develop a long-range electric power plan with public input for the American Pacific Northwest region. This plan in turn serves as a guide for individual utilities in the development of their respective resource plans.

During its in camera discussions for this report, the Committee discussed the concept of an independent review body in particular. However, no overall or consensus position emerged on this subject. It was also felt that these matters, while important, were not the primary focus of the Committee's primary objective of reviewing DSPS. Therefore no specific recommendation is put forward.

Nonetheless, the Committee understands that the Ministry of Energy is involved in a review of the Power Corporation Act with the possible introduction of revised legislation in the immediate future. The Committee believes that its submissions/testimony related to power system planning should be taken into consideration in the Ministry's review process.

Recommendation

23. The Ministry of Energy in its review and upcoming proposals for revision to the Power Corporation Act should take into consideration the submissions to the Select Committee on Energy (1988-89) on the power system planning process, in particular, and other appropriate matters such as demand management, cogeneration, and private/parallel generation.

The Approval Process

Commentary

Extensive testimony and documentation was presented to the Committee which addressed the issue of the length of time required to obtain approval for major electrical generation or transmission projects ("Energy Committee Hearing Summary," pp. 70 - 73).

Ontario Hydro's strategy statement 5.2.1 states that the utility "will seek improvements to the planning approval process to provide increased flexibility" (Appendix B, p. 4). The utility also presented material to the Committee to indicate that the lead time to obtain approval and build major generating stations may be up to 13 years.

In its review of DSPS, the Technical Advisory Panel stated:

We recognize that the review and approval process of Hydro's projects is already long and burdensome. Rather than simply adding a technical review as another step, the whole train of regulatory procedures needs to be examined with a view to streamlining it. The existing statute under which consolidated hearings are held in Ontario shows what can be done. We believe the results of such streamlining would be well worth the effort it would entail. (Report of the Electricity Planning Technical Advisory Panel to the Minister of Energy, 1988, p. 49)

The Orillia Water, Light and Power Commission described before the Committee the difficulties experienced in the early eighties in attempting to obtain approval for a small hydraulic development. Its brief addresses the complexity of the current approval process as follows:

I do not wish to suggest that for the sake of being able to proceed with a project that all rules and controls should be forgotten. It is absolutely essential that care be taken of our environment. Legislation must exist to insure that development of a project does not destroy it. However, it is equally important the legislation promote the development of financially and environmentally sound projects. Quite simply the evaluation process should determine the quality of the project and whether it proceeds or fails. The red tape of the process should never defeat any project. (Orillia Water, Light and Power Commission, "The Select Committee on Energy Review of the Draft Demand/Supply Planning Strategy," 21 September 1988, pp. 6 - 7, see Appendix E, Exhibit 75).

While the Committee generally sympathizes with concerns regarding the complexity and length of the approval process, the Committee does not feel it is in a position at this time to make specific recommendations on such a complex matter. The approval of major projects impinges upon a variety of diverse interests, concerns, policies and legislation. Social, financial/economic, environmental and land use planning considerations are some of the key factors that must be taken into consideration. The Committee believes that as an initial approach to dealing with the approval process, a critical interministerial evaluation of this process, with input from Ontario Hydro, should be undertaken. This review should examine relevant legislation and public policies affecting the approval of major electric power projects. The problems associated with this process should be identified along with proposed remedies or solutions. Such a review would then be the basis for more informed discussion and possible modification of approval procedures.

Another concept that was raised during the public hearings and also discussed by the Committee during the debate on this report was the concept of "approval banking." This, as indicated in the following quotation from testimony by Mr. Robert Franklin, Chairman and President of Ontario Hydro, could involve obtaining some form of approval for a major project well in advance of the day when actual construction would have to commence. The thinking is that the lead time to complete the project would thereby be reduced.

. . . , there may be some way of banking approvals, of getting approvals in advance, banking them, as I suggested that we do, putting them on the shelf and then when you can prove need at some later point, with a much smaller hearing, much quicker hearing, then you would be able to produce that generating plant or that transmission line faster.

Furthermore:

I would think that the environment effects and things like that would probably be dealt with in that first hearing. The second hearing would

be one of need: . . . I know it is probably heresy to say, but lots of tribunals are under time deadlines. I understand our existing procedures are open-ended. It seems to me that there should be an obligation upon the proponent, in this case Ontario Hydro, and an obligation upon those people who are opposed or in support of it, to work within certain time guidelines . . . (Ontario, Legislative Assembly, Select Committee on Energy - Electricity Demand and Supply, "Draft Transcript," October 1988, p. 66).

In the Committee discussion of this concept of approvals banking, no consensus position emerged. Progressive Conservative members of the Committee appeared to generally support this concept while New Democratic members expressed strong reservations. Since no consensus Committee position was evident during this discussion, no Committee recommendation is put forward in this matter. "Approvals banking," however, will obviously form the basis of future public policy debate.

Recommendation

24. The Ministry of Energy should initiate and co-ordinate a critical interministerial evaluation, with the involvement of Ontario Hydro, of the approval process for major electrical generation/transmission projects. This review should identify problems with existing legislation and policies, and put forward recommendations for the possible "streamlining" of this approval process.

Economic Issues and Ontario Hydro

Commentary

Regarding Ontario Hydro's economic methodology employed to assess various demand/supply options, the Committee heard a variety of viewpoints from deputants, consultants and various expert witnesses. For example, some opinion was expressed that the long-term discount rate used by Ontario Hydro was too low and thereby tended to favour capital-intensive generating options such as nuclear.

There was also some discussion of the assertion that Ontario Hydro's significant borrowing activity in the capital markets "crowds out" other private sector borrowing and investment activities. There were a variety of opinions expressed on these matters and the Committee does not believe it is in a position to make specific recommendations on such complex technical matters ("Energy Committee Hearing Summary," pp. 13 - 15 in Volume 2 highlights the range of viewpoints on this issue).

In addition, there was some discussion before the Committee of the validity of and assumptions behind Ontario Hydro's standard cost methodology. This technique is used to conduct a fair and standardized comparison of the costs of the various supply options.

On these various complex economic matters, the Committee does not believe that it heard sufficient testimony to take a firm position and no specific recommendations were formulated. Nonetheless, the Committee in general terms believes that public officials in either the Ministry of Energy or Ontario Hydro should be aware of such technical concerns and be prepared to periodically reassess this economic methodology. On occasion it may be appropriate to commission external and public reviews of such techniques. For example, the Committee notes that the Technical Advisory Panel raised questions regarding Ontario Hydro's nuclear cost data and recommended "an independent, thorough review of CANDU nuclear costs in Ontario conducted by eminently qualified experts" (Report of the Electricity Planning Technical Advisory Panel to the Minister of Energy, 1988, p. xi). As a direct result of this recommendation, the Minister of Energy on October 19, 1988, announced an "Inquiry into CANDU Costs." The Committee welcomes this initiative and looks forward to the timely completion of this review.

Forecasting and Dealing with Uncertainty

Commentary

Based upon the testimony of Ontario Hydro staff and other technical witnesses, the Committee appreciates that load forecasting through the use of econometric models is a difficult and complex undertaking. The Committee also understands that a broad range of factors must be taken into account in this exercise and that it is no longer sufficient to forecast projected power requirements solely based upon past trends. For example, the previous Select Committee on Energy (1986) made reference to a power surplus. It now appears that such a surplus no longer can be expected.

Since it is not possible to exactly predict the future there will always be an element of uncertainty in such an exercise, although the Committee understands that Ontario Hydro is continually involved in efforts to refine and improve its forecasting methodology. The focus of such activity should be efforts to reduce uncertainty.

A variety of deputants and reports, including the Technical Advisory Panel, Professor John Robinson of the University of Waterloo, Department of Environmental and Resource Studies, and the previous (1985-86) Select Committee on Energy advocated more of a bottom-up, end-

use approach to demand forecasting ("Energy Committee Hearing Summary," pp. 20 - 22). The Committee understands that Ontario Hydro will be applying more sophisticated end-use models to its forecasting and is supportive of such initiatives.

In a broader sense the Committee also believes that the strategic directions and priorities set out in this report to emphasize refurbishing the existing system, demand management, cogeneration, parallel generation and development of remaining hydraulic resources will enhance flexibility and reliability in meeting demand for the immediate future. This approach should also provide ample time to plan and better assess the timing of the need for major new generating capacity that might be required after the completion of the Darlington Nuclear Generating Station.

Recommendation

25. Ontario Hydro should give high priority to reducing uncertainty in its forecasting.

Role of Natural Gas

Commentary

The Committee notes that natural gas is not specifically mentioned in the supply option strategy statements of DSPS (Appendix B, pp. 4 - 5). Nonetheless, based upon extensive testimony before the Committee by representatives of the gas industry and other interested parties, it would appear that natural gas could play an increased role, in the short-term and medium-term, in meeting a portion of the province's generating requirements ("Energy Committee Hearing Summary," pp. 80 - 81). Natural gas would also be important to industrial cogeneration projects. However, because of the attractiveness and importance of natural gas as a fuel for residential heating, the Committee believes that the possible expanded use of natural gas to generate electricity should in no way adversely affect the supply of this fuel for home heating in Ontario.

The Committee believes that natural gas could serve to increase flexibility and diversity of supply while at the same time being a relatively clean fuel. Changing market conditions resulting in reduced prices and increased availability in longer-term contracts could improve the attractiveness of natural gas as a fuel to generate an increased portion of Ontario's future electrical energy requirements.

Recommendation

26. Ontario Hydro and the Ministry of Energy should reassess the potential role of natural gas in meeting a portion of Ontario's future electrical generating requirements in view of changing market conditions affecting the price and supply of this fuel.

Power PurchasesCommentary

The Committee understands that only with the construction of additional new and costly hydraulic generating capacity, could the neighbouring provinces of Quebec and Manitoba provide firm electrical power and energy to Ontario under long-term contractual arrangements. Such a supply source could add diversity and delay the need for Ontario to commit to the construction of major new generating capacity. However, the Committee also understands that the per unit cost of power from such remote new hydraulic installations could be considerable and may substantially exceed the cost of power from new sources within Ontario.

On the other hand, major new purchases of power from neighbouring provinces would require the construction of lengthy additions to existing transmission networks both within and outside Ontario. In addition, the neighbouring provinces, and Quebec in particular, have opportunities to sell this power at higher rates into the American market. In the Committee's view this would probably necessitate these neighbouring provincial utilities charging similarly high rates for major sales to Ontario. These rates would probably exceed Ontario Hydro's own cost of power if generated in Ontario. Also, based upon technical evidence presented to the Committee, while there would be an economic benefit to the nation as a whole, most of the economic benefits associated with a purchase option would flow to the neighbouring province ("Energy Committee Hearing Summary," p. 106). There was also little indication of significant interest by our neighbours in a joint venture, whereby Ontario Hydro would be involved in the joint construction or financing of a generating installation in a neighbouring province in exchange for guaranteeing the supply of long-term firm power.

In formulating a stance on the purchase option, the Committee reiterates the position of the previous Select Committee on Energy (1986) (see Appendix F, Recommendation 15) in that a major firm purchase of power from neighbouring provinces should not be pursued until maximum efforts are made to develop and utilize the indigenous (existing generation, demand management, private generation and remaining hydraulic) resources of the province.

Recommendation

27. No major firm purchase of power from neighbouring provinces should be pursued until maximum efforts are made to utilize the cost effective indigenous resources of Ontario, e.g., demand management, existing generation, private generation and remaining hydraulic.

Power ExportsCommentary

The Committee notes that DSPS does not contain any strategy statement relating to power exports. Nonetheless, as indicated below, this issue generated extensive discussion among Committee members during the in camera deliberations associated with the drafting of this report.

Ontario Hydro's testimony before the Committee indicated that the utility has not committed and does not plan to commit capacity to meet power requirements outside of Ontario, i.e., exports. However, potential short-term opportunities to interchange power with neighbouring utilities are and will be exploited ("Energy Committee Hearing Summary," p. 111).

Etobicoke Hydro, for example, in its submission to the Committee, advocated that "Ontario Hydro become a net exporter of electrical power - not an importer" (Appendix E, Exhibit 56, p. 12). In addition, as part of its submission to the "Interministerial Review" of DSPS, the Office of Economic Policy, Ministry of Treasury and Economics noted:

In concert with the development of plans for system expansion, the potential for exports should be determined as well as its economic value to the province and consumers (Review by Government Ministries of Ontario Hydro's Draft Demand/Supply Planning Strategy, Report to the Minister of Energy, 1988, p. 84).

In the Committee's discussion of exports, a broad range of party and individual positions were expressed as follows:

- The Progressive Conservative Party members of the Committee expressed the opinion that Ontario Hydro should be permitted to construct generating capacity for export and that as domestic demand increases, exports would be gradually reduced. Building for export would enhance security of supply within Ontario.

- The prospect of major power exports, which would likely be based upon the construction of high capital cost coal or nuclear plants, was not supported by the New Democratic Party members of the Committee. Concerns were also raised regarding the environmental impact and cost to Ontario consumers of such an export strategy. Particular concern was also expressed regarding the long-term costs of nuclear waste disposal and decommissioning associated with a CANDU-based export strategy.

Among government members of the Committee a variety of opinions were put forward:

- Concern was expressed regarding the economic viability of the export option and the influence of the Canada - United States Free Trade Agreement. The possible impacts upon domestic power rates and the cost of doing business in Ontario were noted.
- Meeting demands for power in the United States with surplus generation in Ontario could serve to minimize the risks and uncertainty associated with power demand and supply planning in Ontario. The opinion was expressed that the export option therefore merits analysis.
- If Ontario Hydro were to be in a surplus situation, there is nothing inherently wrong with this since the power could be exported if available, but it might not be appropriate to build exclusively for export. Surplus power would also ensure the availability of a reliable supply for Ontario needs.

In conclusion there was no Committee consensus on exports and therefore no Committee recommendations are forthcoming on this topic. Nonetheless, the Committee realizes that the matter of power exports by Ontario Hydro may still be a topic of discussion or study for the future. Matters for possible future analysis could be an assessment of the economic, social and environmental benefits and costs of a major program to build for export.

RECOMMENDATIONS OF THE PREVIOUS (1985-86) SELECT COMMITTEE ON ENERGY

Commentary

In the final stage of its in camera deliberations on this report, the Committee reviewed the recommendations of the previous Select Committee of Energy (1985-86) (see Appendix F). In general terms the Committee believes that this previous Committee set the stage for the current recognition of the important role to be played by demand management, cogeneration and private generation. Many of the recommendations of the Final Report of that Committee also deal with the power planning and regulatory processes (Appendix F, Recommendations 4 and 7 - 10 in particular). Recommendations are made with specific regard to the roles of the Ministry of Energy, Ontario Hydro and Ontario Energy Board.

In addition, the previous Select Committee recommended that "the Power Corporation Act should be amended to allow Ontario Hydro to engage in the full range of options for promoting conservation" (Recommendation 12 in Appendix F). During testimony to the current Committee it was reiterated that this legislation does not give Ontario Hydro the authority to make grants for energy conservation programs. In general terms the Committee believes that all pertinent legislation, and the Power Corporation Act in particular, should be reviewed with respect to the previous and current Energy Committee recommendations. The general objective of such an exercise should be the removal of legislative barriers to the achievement of appropriate objectives relating to the planning of Ontario's future power requirements.

The Committee believes that these earlier recommendations should be reviewed in connection with current public policy to promote demand management/conservation and private generation and to adjust the power system planning process.

Recommendations

28. The government and the Ministry of Energy should actively consider the recommendations of the Select Committee on Energy (1985-86) particularly those dealing with demand management/conservation, private generation and the power system planning process.
29. The government and the Ministry of Energy should conduct a review of all pertinent legislation, and the Power Corporation Act in particular, which is relevant to the recommendations of the previous (1985-86) and current (1988-89) Select Committees on Energy. The general objective of this analysis should be to assess the removal of legislative barriers to the achievement of appropriate power planning objectives.

ESTABLISHMENT OF A STANDING COMMITTEE ON ENERGY

Commentary

Based upon this experience of reviewing DSPS, the Committee has gained an appreciation of the importance and complexity of energy planning matters. From these deliberations the Committee understands that there will be related and new energy issues which will merit public and political review in the future. To best ensure that such reviews are conducted in a consistent and informed manner, the Committee believes that a Standing Committee on Energy should be established. However, if such a Committee is not immediately established the mandate of this Select Committee on Energy should be extended to proceed with these activities.

Some of these matters could consist of reviews of:

- final plans arising from the DSPS process;
- the findings of the upcoming "Inquiry into CANDU Costs";
- revisions to the Power Corporation Act;
- proposed regulations under the Energy Efficiency Act;
- future more detailed analyses and findings relating to the relative economic, social and environmental costs and benefits of various new supply options and the identification of preferred major generating sources;
- other pertinent Ontario Hydro or Ministry of Energy energy planning documents; and
- major Ministry of Energy or Ontario Hydro studies or reports relating to energy supply and availability for Ontario.

Recommendation

30. A Standing Committee on Energy of the Ontario Legislature should be established to review energy matters and matters pertaining to Ontario Hydro in particular.

APPENDIX A

LIST OF
MAJOR STUDIES OR SUPPORT DOCUMENTS
MENTIONED IN THIS REPORT

Ontario. Review by Government Ministries of Ontario Hydro's Draft Demand/Supply Planning Strategy. Report. Toronto: Ministry of Energy, July 1988.

Ontario. Review of Ontario Hydro's Draft Planning Strategy. Report of the Electricity Planning, Technical Advisory Panel to the Minister of Energy [EPTAP]. Toronto: Ministry of Energy, July 1988.

Ontario Hydro. System Planning Division. Meeting Future Energy Needs: Draft Demand/Supply Planning Strategy, Report 666 SP. Toronto: Ontario Hydro, December 1987.

Ontario Hydro. System Planning Division. Draft Demand/Supply Planning Strategy, Report 666B SP. Toronto: Ontario Hydro, September 1988 (Reproduced in Appendix B).

Ontario Nuclear Safety Review (F. Kenneth Hare, Commissioner). The Safety of Ontario Nuclear Power Reactors: A Scientific and Technical Review, vol. 1: Report to the Minister. Toronto: The Review, February 1988.

Richmond, Jerry and Yeager, Lewis. Energy Committee Hearing Summary: Major Viewpoints, Recommendations and Concerns re: Ontario Hydro's Draft Demand/Supply Planning Strategy (DSPS), prepared for the Ontario Select Committee on Energy. Toronto: Legislative Research Service, December 1988 (Reproduced in Volume 2 of this Report).

APPENDIX B

Ontario Hydro's Draft/Demand Supply Planning Strategy *

***Source:** Ontario Hydro, System Planning Division, Draft Demand/Supply Planning Strategy, Report 666B SP, September 1988.

**DRAFT DEMAND/SUPPLY
PLANNING STRATEGY**

**REPORT 666B SP
SEPTEMBER 1988**

System Planning Division



FOREWORD

During the four-year period 1984 to 1987, Ontario Hydro conducted a Demand/Supply Options Study. All demand and supply options were considered that were relevant to meeting the future electricity needs of Ontario.

The study included: identification of options; characterizing the options in terms of cost and social implications; obtaining broad public input on option preferences and social values pertaining to electric service; and performing representative plan analysis.

The study resulted in the development of a Draft Demand/Supply Planning Strategy issued in December 1987. This strategy is undergoing a number of reviews in 1988 including a review by the Ontario Legislature's Select Committee on Energy.

A final Demand/Supply Planning Strategy will be produced in early 1989 after the 1988 reviews are complete.

The Demand/Supply Planning Strategy is a set of principles, priorities and guides and comprises 52 strategic statements pertaining to the demand/supply options.

The strategy will be applied in the development and updating of annual plans to meet the future electricity needs of Ontario.

This document contains:

- The set of strategic thrusts which represent the essence of the strategy.
- A diagram showing the structure of the strategy.
- The complete draft strategy.

The Demand/Supply Planning Strategy is not intended to describe how planning will be done nor is it a definitive plan of what options, how much, where or when.

Lorne G. McConnell
Vice President
Corporate Planning Branch
Ontario Hydro

PRIORITY STRATEGIC DIRECTIONS

PRIORITY STRATEGIC DIRECTIONS

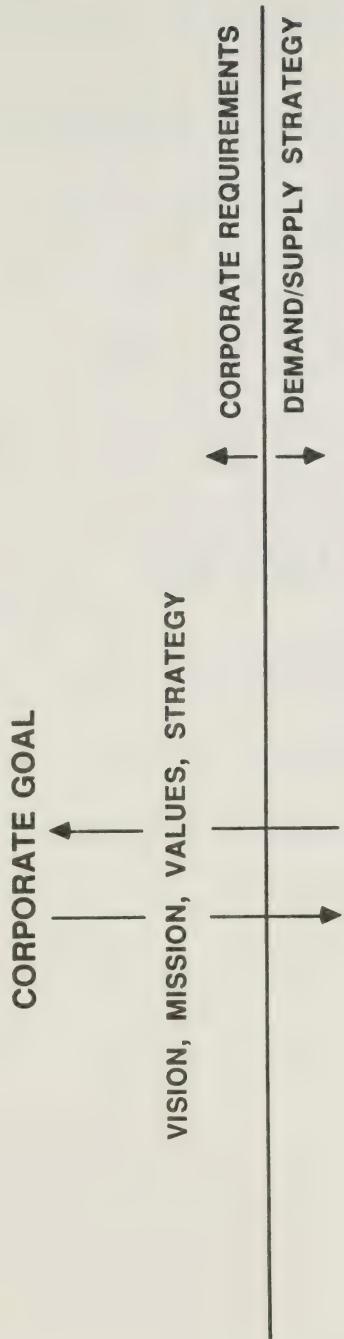
The Draft Strategy Contains Five Basic Thrusts:

1. In the 90's, your electricity supply will largely be met with the Power System which is operating today or already under construction. However, we do have a lot of work to do in rehabilitating aging hydro stations, aging transmission and aging thermal stations. We also must make sure the nuclear stations achieve their full economic lifetime.
2. To meet the future, we are involved in an aggressive demand management program to minimize the growth. This involves peak shifting programs and improved electrical use efficiency. Close cooperation is needed between Ontario Hydro, the municipal utilities, all customers and the electrical industry. Although demand management is not new, we are proposing a major increase in its intensity.
3. We are also proposing to achieve part of the needed supply by purchasing power from private developers. We will be particularly encouraging renewable generation such as small hydro and wood waste. Also, we will favour fossil generation which employs high efficiency cogeneration.
4. We propose to develop all remaining economic hydro-electric generation in an orderly manner.
5. We expect there will still be a need for further major new supply options such as clean coal, oil, gas and nuclear so it is important to keep these options open. We are also considering purchases from Quebec and Manitoba as a good option. New plants are also required to replace old plant which is economically obsolete.

We feel this strategy best meets the future electricity needs of Ontario and will give the flexibility to cope with an uncertain future.

STRUCTURE OF THE STRATEGY

STRUCTURE OF THE STRATEGY



GENERAL STRATEGIC PRINCIPLES



THE FULL STRATEGY

DRAFT DEMAND/SUPPLY PLANNING STRATEGY

Each annual Demand/Supply Plan will be developed based on the following strategic considerations:

1 General Strategic Principles

- 1.1 The primary objective of demand/supply programs is to contribute to customer satisfaction.
- 1.2 Reliability is paramount.
- 1.3 Low customer cost is vital.
- 1.4 Ontario Hydro must ensure that its activities are conducted in an environmentally and socially acceptable manner.
- 1.5 Rates must continue to be based on costs.

2 General Demand/Supply Strategies

2.1 Measures of Cost

- 2.1.1 Ontario Hydro will aim to develop a mix of demand and supply options that provides electricity service to customers at lowest total customer cost.
- 2.1.2 The cost of meeting social and environmental requirements will be included in cost evaluations of demand/supply options.

2.2 Response to Uncertain Growth

- 2.2.1 The load forecast will include upper and lower projections that cover a reasonable range of possible outcomes.
- 2.2.2 Contingency plans must be prepared that identify practical options to respond to upper and lower load projections.
- 2.2.3 Demand options will be implemented, and supply options will be committed, in time to meet the most likely load growth economically and reliably.

2.3 Resource Smoothing

- 2.3 To maintain flexibility and to reduce costs resource smoothing will be considered.

2.4 Resource Preferences

2.4 Resources meeting the basic criteria of low cost, reliability, flexibility and quality will be preferred based on the nature of the primary energy source in the following order:

- electricity efficiency, renewable energy and waste fuels;
- plentiful fuels;
- scarce fuels.

and based on their source in the following order:

- Ontario indigenous resources and electricity efficiency;
- other Canadian resources;
- foreign resources.

2.5 Public Consultation

2.5 Consultation with customers, the public, governments and the legislature will continue to be an integral part of the planning process.

3 Demand Management

3.1 Demand Reducing Options

3.1 Demand reducing options will be pursued to the full extent they are economic compared to the available supply options in the relevant planning period.

3.2 Load Shifting Options

3.2.1 Demand management programs aimed at shifting demand from peak to off-peak times will be selected to respect system limits on the usefulness of load shifting.

3.2.2 The choice between load shifting and energy storage will reflect the costs and benefits of each option.

3.3 Demand Increasing Options

3.3 Demand programs aimed at increasing demand will be pursued where they provide benefits to customers in total.

3.4 Cooperation with Municipal Utilities

3.4 The planning and implementation of demand management options will be undertaken in close cooperation with the municipal utilities.

3.5 Timing of Demand Management

3.5.1 Development and implementation of economic demand reduction programs should be started early enough to be effective in contributing to the most cost effective demand/supply balance.

3.5.2 Priority should be given to influencing the new market rather than the retrofit.

3.6 Demand Management - Research and Development

3.6.1 Technical research and market development to support existing and planned demand management programs will be given a high priority so that demand options can be efficiently implemented in a timely manner.

3.6.2 To provide flexibility, technical research and market demonstration programs shall be undertaken to provide information on the potential for new demand management programs.

3.7 Demand Management - Promotion & Education

3.7 Education, information dissemination, audits, and advertising will be pursued to make customers aware of the opportunities for the efficient and effective use of electricity.

3.8 Rate Induced Demand Management

3.8.1 General rates will be based on average costs.

3.8.2 Rates may be time differentiated to give incentives to shift load to off-peak periods.

3.8.3 Special rates for non-standard conditions of service may be implemented to manage demand for specific purposes.

3.8.4 Special rates should recover at least the additional cost of supplying the electricity sold under these rates.

3.9 Financial Incentives for Demand Management

3.9.1 Incentives should be high enough to encourage the development of a large part of the potential that is beneficial to customers in total.

3.9.2 Customers who participate and receive direct benefits should provide a substantial contribution to the cost.

3.9.3 The level of incentives should be acceptable to customers in general.

3.9.4 Financial incentives should be based on lifetime benefits; loans and grants may be used to increase the return to customers in early years.

3.10 Energy Efficiency Standards

3.10 Ontario Hydro will work with governments, industry and customers towards developing standards for buildings, appliances, etc, including the highest electrical energy efficiencies that are widely acceptable.

3.11 Other Barriers

3.11 Ontario Hydro will identify other barriers to increased efficiency and work with other parties as appropriate towards the reduction or elimination of such barriers.

4 Independent Generation

- 4.1 Rates for purchasing power from independent generators and incentives for independent generation projects shall be up to the avoided cost to the system as a whole.
- 4.2 Rates and incentives for independent generation may vary because avoided cost depends on many factors, including the reliability, timing and location of the deliveries.
- 4.3 Ontario Hydro will regularly communicate the need for independent generation to potential independent generators; request proposals to contribute to that need; and negotiate detailed terms and conditions with suppliers whose proposals have potential to satisfactorily meet the need.
- 4.4 Ontario Hydro will establish standard rates for purchases of independent generation having a capacity of five megawatts or less. The standard rates for hydroelectric or other renewable sources will be set at the full avoided cost.

5 Supply Options

5.1 Supply General

5.1 Major increases in supply will be provided by the lowest cost supply or purchase options available to meet the need after allowing for the effects of demand management and independent generation.

5.2 Supply Approvals

- 5.2.1 Ontario Hydro will seek improvements to the planning approval process to provide increased flexibility.
- 5.2.2 Approval for new transmission to incorporate new generation shall be sought as part of the generation approval process.

5.3 Unit Sizes, Plant Size and Flexibility

5.3 Single or two unit commitment of economically sized units in multi-unit stations will be considered to maintain flexibility.

5.4 Site Acquisition

5.4 New sites for major generating plant shall be sought to allow generating stations of economic size to be built while maintaining a geographical balance of electricity demand and supply.

5.5 Existing Plant

5.5.1 A high priority should be given to maintaining and improving the performance of the existing supply facilities.

5.5.2 Rehabilitation or redevelopment of existing facilities should be assessed along with the other demand and supply options.

5.5.3 To provide a flexibility margin, consideration should be given to retaining in a preserved state existing plant that has reached the end of its useful life.

5.6 Alternative Generation

5.6.1 Ontario Hydro will continue to investigate the technical and economic feasibility of alternative generation sources, particularly those that use renewable and Ontario resources.

5.6.2 Ontario Hydro will implement alternative generation sources in specific situations (eg, isolated systems) where they are the most beneficial alternatives.

5.7 Hydraulic

5.7 The economic hydraulic developments should be undertaken in an orderly program.

5.8 Nuclear

5.8 Ontario Hydro will seek to maintain CANDU nuclear so that it is available for future development.

5.9 Fossil

5.9 Ontario Hydro will maintain and improve its knowledge base of new developing coal burning technologies that promise reduced emissions and/or increased flexibility.

6 Purchases

6.1 Ontario Hydro will continue to depend on neighbouring systems for emergency support to a level that is consistent with mutual benefit.

6.2 Long term firm purchases of hydraulic power from neighbouring provinces will be considered as an acceptable alternative to building new supply facilities.

APPENDIX C
Glossary of Terms*

***Source:** Ontario Hydro, System Planning Division, Meeting Future Energy Needs: Draft Demand/Supply Planning Strategy, Report 666 SP, December 1987, Chapter 13, Glossary of Terms.

13 Glossary of Terms

ALTERNATIVE ENERGY/TECHNOLOGY: This term is used to describe energy producing or harnessing technologies not widely used. They generally use renewable resources in small, decentralized installations. Examples are photovoltaics, solar heating, wind generation and wood and waste fuelled generation.

ADVANCED APPROVAL: An approval to develop facilities which is obtained in advance of the date at which acquisition of materials must start. Such an approval would not be acted upon until the need arises. (Also referred to as 'Banked Approval').

AVERAGE DEMAND: The demand on, or the power output of, an electric system or any of its parts over an interval of time. Average demand is calculated by dividing energy by the number of hours in the interval. Average demand is expressed in kilowatts, megawatts, etc. (See Power Units.) In 1985, the average demand of the typical Ontario residence was about 1.2 kW while the average demand placed on the Ontario Hydro system by Ontario customers was about 13,250,000 kW (13,250 MW). (Also referred to as 'Average Load', 'Average Power' and 'Average Energy Demand'.)

BANKED APPROVAL: (See Advanced Approval)

BASE LOAD GENERATION: Those generating facilities within a utility system which have low operating costs and which are therefore run as much as possible, in order to minimize system operating costs. Except for maintenance periods, base load generation is usually run all the time. In Ontario this includes nuclear and some hydraulic generation.

BULK ELECTRICITY SYSTEM (BES): The generation and high voltage transmission facilities (generally 115 kV and up) considered as a whole.

CAPACITY: The greatest load which a unit, station or system can supply. Capacity is usually measured in kilowatts, megawatts, etc. (See Power Units).

CAPACITY FACTOR: Total actual output of a unit or station as a proportion of the output that would result if it was run at capacity over the same time period. Capacity factor is usually expressed as a percentage.

$$\text{Capacity Factor} = \frac{\text{Energy}}{\text{Capacity} \times \text{Time}} \times 100\%$$

COGENERATION: The generation of electricity in conjunction with the production of useful heat, usually steam, for industrial purposes. Where an industrial firm wishes to generate both steam and electricity, it is often more energy efficient and cheaper to generate the two together rather than separately, or to generate steam and buy electricity. Cogeneration plants are usually fuelled by oil, natural gas or wood waste.

COMMITTED RESOURCES: Once a decision has been made to construct a particular facility or implement a particular demand management option, the resulting resource is said to be committed. Commitment of supply additions follows approval under the Environmental Assessment Act and requires a decision by the Ontario Hydro Board of Directors to be confirmed by the Provincial Cabinet. Commonly used to refer to BES additions, the term is being increasingly applied to demand management programs and studies. (Hence the use of committed 'Resources' rather than committed 'Generation'.)

CONSERVATION: The wise use of all resources including increasing efficiency of use, reducing consumption of scarce resources and reducing waste. Energy conservation may mean using more of one type of energy efficiently to replace an inefficient use of another, resulting in an overall reduction in energy use. Thus, energy conservation and electricity use reduction are not synonymous.

DEMAND: (1) In economics, the desire of purchasers for a commodity, usually inversely related to price. Demand for electricity also varies with time of day, season and economic conditions.

DEMAND: (2) In the electrical industry, 'Demand' is often used synonymously with 'Power' which is the rate at which electric energy is delivered at a given instant or averaged over some designated period of time. It is expressed in kilowatts, megawatts, etc. (See Power Units.)

DEMAND MANAGEMENT: Actions taken by a utility or other agency intended to influence the amount or timing of customers' use of electricity. These actions can be divided into three groups: load growth; load shifting; and load reducing, which usually involves efficiency improvements.

DEMAND/SUPPLY OPTION: This term is used to describe technologies, techniques or programs which could be used to meet future electrical needs. Demand options are those which could be used to reduce electrical needs or the rate of growth of those needs. Supply options are additional generating plants or improvements to, or extending the lives of, existing plants.

DISTRIBUTION SYSTEM: Facilities (lines, transformers, switches, etc) used to distribute electricity over short distances from the transmission system to customers. Distribution is generally at relatively low voltage (44 kV and less).

DIVERSITY (OF LOADS): The peak demands of all customers do not all occur at the same time. Therefore the peak demand placed on an electrical system is significantly less than the sum of the peaks of the individual customers. This difference is called diversity, and must be considered when developing a load forecast based on the individual forecasts of many customers.

DIVERSITY (OF SUPPLY): Diversity is also used in this report to describe a system having a variety of types of generation, using a variety of fuels.

ELECTRO-TECHNOLOGY: A technology that uses electricity in its processes, especially new applications of electricity, including those that displace the use of other energy sources. For example, the use of electrically driven heat pumps for kiln drying wood in place of air heated by on-site fuel combustion.

ENERGY: The ability to do work. Electric energy, the product of power and the time over which it is used or produced, is commonly measured in kilowatthours. (See Energy Units.)

ENERGY UNITS:

WATTHOUR (Wh): A small unit of measure of electrical energy. One watthour is the energy used in one hour by a device that uses one watt of power. For example, a 100 watt light bulb will use 100 watthours if left on for one hour. Similarly, a 50 watt bulb must be left on for two hours for it to consume 100 watthours of energy. The watthour is usually augmented by a prefix to create more practical, larger units:

<u>Prefix</u>	<u>Abbreviation</u>	<u>Multiplier</u>
kilo	k	10^3 or 1,000
mega	M	10^6 or 1,000,000
giga	G	10^9 or 1,000,000,000
tera	T	10^{12} or 1,000,000,000,000

KILOWATTHOUR (kWh): One kilowatthour equals 1000 watthours. Ten 100 watt light bulbs or a typical clothes iron would consume 1 kWh if left on for one hour. The kilowatthour is the unit of measure of energy which may be most familiar to customers, as it is the unit appearing on electricity bills.

MEGAWATTHOUR (MWh): One megawatthour equals one million watthours or one thousand kilowatthours. The average Ontario household uses just over 10 MWh in one year.

GIGAWATTHOUR (GWh): One gigawatthour equals one billion watthours or one million kilowatthours. The average large industrial customer of Ontario Hydro uses over 150 GWh in one year.

TERAWATTHOUR (TWh): One terawatthour equals one billion kilowatthours. Energy made available by Ontario Hydro to Ontario customers in 1985 was about 116 TWh.

ENERGY SERVICE: The task performed by energy. Some services are commonly fuelled by only one energy type, while others may use a variety. For example, storage of perishable food is a service usually provided by refrigerators run by electricity. Cooking may employ natural gas or electricity while space heating can be provided by electricity, natural gas or oil.

FORECAST RANGE: Since the future cannot be predicted with absolute accuracy or certainty, the forecast of future needs for electricity is presented as a band rather than a single value. The width of this band is called the Forecast Range.

GENERATING UNIT: A generator together with the device turning it. A generating unit can usually operate independently of other units in a multi-unit generating station.

GIGAWATT (GW): (See Power Units.)

GIGAWATTHOUR (GWh): (See Energy Units.)

GROSS PROVINCIAL PRODUCT (GPP): The annual total value of goods and services produced within an economy. In this report it refers to the Province of Ontario. (Also known as Gross Domestic Product, GDP.)

INDEPENDENT GENERATION: In this report, independent generation means generation owned or operated by producers other than Ontario Hydro. These producers usually have generating plants for the purpose of supplying electric power required in the conduct of their industrial and commercial operations. The term also covers plants whose sole purpose is the sale of electricity to Ontario Hydro. Independent generation does not include purchases of electricity from out of province.

INTERRUPTIBLE RATE: A discounted rate available to large industrial customers who agree to have their electrical service interrupted or reduced during times of system capacity shortfall.

INVERTED RATE: A rate structure in which the unit charge for electricity increases as the amount of electricity used increases.

KILOWATT (kW): (See Power Units.)

KILOWATTHOUR (kWh): (See Energy Units.)

LOAD: See Demand (2)

LOAD FACTOR: The ratio of average load supplied during a period to the maximum load or peak demand in that period. Load factor may also be thought of as the ratio of actual energy consumed during a period to the consumption that would result if consumption had been at the period's peak level the entire time.

$$\text{Load factor} = \frac{\text{Energy}}{\text{Peak Demand} \times \text{Time}} \times 100\%$$

Load factor can be used to describe individual customers or the entire system. The annual load factor of the Ontario Hydro system is about 68%.

LOAD SHAPE: A term describing the pattern of electricity use or production when demand is plotted against time. (Also known as Load Profile, Load Curve; refer also to Fig. 5.4)

LOAD SHIFTING: The shifting of electrical demands from one period to another, usually from high load to low load periods. Load shifting may result from direct control of customers' loads by the utility or from rate or other financial incentives. Load shifting can postpone the need for new capacity additions by reducing peak demand.

LOCKED-IN ENERGY: Energy production capability at a generating station which cannot be used because of inadequate transmission capability connecting the generating station to the Bulk Electricity System.

LOWER LOAD PROJECTION: This is a term used to describe a future in which load grows at the rate forecast by the lower end of the load forecast range.

MARGINAL COST: The cost of supplying an additional unit of output. When the extra output can be supplied by simply increasing production from existing plant the terms usually applied are, 'Short-Run Marginal Cost', or, 'Incremental Cost'. When the extra output cannot be supplied by existing facilities and new plant is built to supply the output, the term 'Long-Run Marginal Cost', is generally used.

MARGINAL COST PRICING: A rate structure in which prices are set at the cost of the last (marginal) unit of production, rather than at cost of production averaged over all output.

MARGINAL COST TEST: When demand management is considered a resource to meet future energy needs, some decision rule is required to determine which options should and should not be pursued. Under the marginal cost test, a demand option would be allowed if it required expenditure (by all parties contributing) less than or equal to the cost of the alternative supply option. (Also known as Societal Test; contrast with No Losers Test.)

MEGAWATT (MW): (See Power Units).

MEGAWATTHOUR (MWh): (See Energy Units).

MOST LIKELY LOAD FORECAST: The load growth described by the middle of the load forecast range. This is the load growth that would occur if all assumptions underlying the forecast hold true and forecast error is zero. In general terms this is the middle of the forecast range of load growth.

MOTHBALL: To retain in a preserved state equipment that is surplus to current needs or has reached the end of its normal life. Equipment that has been mothballed is not available for immediate use but, given sufficient preparation, may be returned to service if required in the future.

MULTI-UNIT GENERATING STATION: A plant containing more than one unit of generator, turbine and associated equipment for converting mechanical (eg, falling water), chemical (eg, the combustion of fossil fuel) or nuclear (eg, the fission of uranium atoms) energy into electrical energy.

NATURAL CONSERVATION: Efficiency improvements that are undertaken by customers without direct financial incentives from the utility or government. Customers undertake natural conservation measures to reduce their electricity bills. (Contrast with Strategic Conservation.)

NO LOSERS TEST: A test which allows utility expenditure on a demand option up to a maximum, beyond which further expenditures would cause rates to rise above the level associated with installation of the alternative supply option. (Also known as Non-Participants Test; contrast with Marginal Cost Test.)

OFF-PEAK PERIOD: Periods during which relatively low demands are placed on a system. Times which are not included in the peak period. (contrast with Peak Period)

PARALLEL GENERATION: Independent generation which is linked to and in synchronization with the bulk electricity system. (See Independent Generation).

PEAK DEMAND: The maximum rate of energy consumption that occurs within a given period of time. Peak demand can refer to the maximum demand placed on a system as a whole, individual parts of a system, or individual customers or applications. In 1985/86 the peak demand on the Ontario Hydro system was over 20 GW. (Also known as 'Peak'; see Power Units.)

PEAK PERIOD: Periods during which relatively high demands are placed on a system. Ontario Hydro's daily system peaks usually occur in the late afternoon/early evening hours during the winter and the late morning during the summer. System load however tends to climb quickly in the early morning and stay relatively flat until late evening. Thus Ontario Hydro's peak period is generally defined as 7 a.m. to 11 p.m., workdays.

PEAKING CAPACITY (or, Peaking Plant): Generating stations which are normally operated only to provide power during maximum load periods.

PLAN: At Ontario Hydro, a resource plan is a scheme which identifies specific demand and supply resources proposed to meet the future electrical needs of the province, their timing and expected contribution. Plans are reviewed and revised regularly as circumstances change.

POWER: The rate at which electric energy is delivered. It is expressed in kilowatts, Megawatts, etc (see Power Units).

POWER UNITS:

WATT (W): A small unit of measure of power. The typical light bulb uses power at the rate of 100 watts. The watt is usually augmented by a prefix to create a more practical, larger unit:

<u>Prefix</u>	<u>Abbreviation</u>	<u>Multiplier</u>
kilo	k	10^3 or 1,000
mega	M	10^6 or 1,000,000
giga	G	10^9 or 1,000,000,000

KILOWATT (kW): One kilowatt equals 1000 watts. Ten 100 watt light bulbs would use 1 kW, as would a typical clothes iron or a large hair dryer. In cold weather, an electrically heated house would use about 10 kW.

MEGAWATT (MW): One megawatt equals one million watts or one thousand kilowatts. For example, 100 electrically heated houses would use about one megawatt as would a small industrial customer. The peak demand on the Ontario Hydro system is about 20,000 megawatts.

GIGAWATT (GW): One gigawatt equals one billion watts or one million kilowatts. The peak demand on the Ontario Hydro system is about 20 GW.

PRIMARY ENERGY: (1) Energy in its naturally occurring form (eg, falling water, uranium, coal, oil), before conversion to its end use, or secondary forms.

PRIMARY ENERGY: (2) Primary energy can also refer to electrical energy delivered to Ontario customers as opposed to secondary energy which generally refers to electricity exports.

RESERVE CAPACITY: The amount by which total system capacity exceeds the peak demand within a given period of time. Some reserve is required to maintain system reliability in anticipation of unexpected high demands or equipment failures. Planning reserve is the amount by which system capacity is planned to exceed forecast annual peak demand. The absolute amount of reserve capacity is usually expressed in MW; when expressed as a percentage of expected peak demand, the term 'Reserve Margin' usually applies.

RESERVES (as in natural resource industries): Resources which are known in location, quantity and quality and which are economically recoverable using currently available technologies.

RESOURCE: (1) In this report, both demand options (load shifting, efficiency improvements) and supply options (rehabilitation of old or construction of new generating facilities) represent resources which may be called upon to meet future electrical needs.

RESOURCE: (2) In general, a resource is anything that can be drawn upon to perform some function or meet some need. Besides natural resources, financial and labour are also considered resources whose availability must be considered when formulating plans.

RESOURCE: (3) In natural resource industries, the term is used to describe the total estimated amount of a mineral, fuel, or energy source, whether or not discovered or currently technologically or economically extractable; quantities of an energy commodity that may be reasonably expected to exist in favorable geologic settings, but that have not yet been identified, or cannot now be extracted because of economic or technological limitations, as well as materials that have not as yet been discovered.

RESOURCE-SMOOTHING: The scheduling of projects such that relatively smooth levels of human, material, and financial resources are needed.

SOCIETAL TEST: (See Marginal Cost Test.)

STANDARD COST: The cost of a demand or supply option calculated and expressed in such a way as to allow cost comparison of options having different lives, load or operating characteristics, etc. Standard costs in this report are expressed in constant (1984) dollars per megawatthour supplied annually. Standard costs are used only for preliminary screening and ranking of individual options.

STRATEGIC CONSERVATION: Efficiency improvements which would not be undertaken by customers based only on the value of savings available to them. Additional financial or other incentives, or removal of some other barrier by the utility or government is required. Such conservation programs are treated in an integrated planning process on a par with new generating capacity.

STRATEGY: In this report, a strategy is a framework or set of guidelines within which planning takes place.

TERAWATTHOUR (Twh): (See Energy Units.)

TIME-DIFFERENTIATED RATES: (See Time-of-Use Rates.)

TIME-OF-USE RATES: Rates which vary based on the time of day, day of the week or season of the year.

TIME SERIES MODEL: An equation or set of equations by which future values of some variable are predicted based on past behaviour of that variable.

TRANSMISSION SYSTEM: Facilities (lines, transformers, switches, etc) used to transport electricity in bulk from sources of supply to other principal parts of the system. Transmission is generally at high voltage (115 kV and above).

UPPER LOAD PROJECTION: This is a term used to describe a future in which load has grown at the rate forecast by the upper end of the load forecast range.

WATT (W): (See Power Units.)

WATTHOUR (Wh): (See Energy Units.)

APPENDIX D

Select Committee on Energy - Witnesses*

***Source:** Compiled by Tannis Manikel, Clerk of the Committee.

SELECT COMMITTEE ON ENERGY

W I T N E S S E S

2 August 1988 to 6 October 1988

JOHN AHEARNE, Vice-President
Resources for the Future

September 27

ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO
Tom Parker, Immediate Past Chairman & Current
Director; Larratt Higgins, Economist; Donald
Nevison, Consulting Engineer

September 19

ATOMIC ENERGY OF CANADA LTD.
Don Lawson, President, CANDU Operations;
Ken Dormuth, Director, Geological and
Environmental Sciences Division, Waste
Management Program Responsibility Centre;
Joel Liederman, General Manager, CANDU Operations

September 27

MICHAEL BERKOWITZ
Professor of Economics
University of Toronto

October 3

BRIDLEWOOD RESIDENTS' HYDRO LINE COMMITTEE
Judy Hunter, President

September 27

CANADIAN EARTH ENERGY ASSOCIATION
Jake Dejong, Director

September 20

CANADIAN ELECTRICAL ASSOCIATION
Wallace Read, President; Hans Konow,
Director, Public Relations

September 19

CANADIAN NUCLEAR ASSOCIATION
Dr. John Runnalls, Chairman; Rita
Dionne-Marsolais, Vice-President,
Marketing; Ian Wilson, Vice-President,
Technology

September 26

CHALK RIVER TECHNICIANS & TECHNOLOGISTS
UNION - Local 1568
Joe Munch, President, Local 1568; Jeff Cox,
First Vice-President; John Murphy, Chairman
of Energy Committee

September 27

HELENE CONNOR-LAJAMBE

October 3

DEEP RIVER AND COUNTY OF RENFREW
Lyall Smith, Mayor

September 27

STEVEN DIENER, Consultant
Steven G. Diener & Associates Limited

September 20

DOW CHEMICAL CANADA INC.
Murray Trask, Vice-President, Manufacturing;
Dennis Barnes, Eastern Business Manager,
Hydrocarbons; Don Dukes, Manager, Hydrocarbon
Well

October 4

ECONOLER INC.
Fred Day, Vice-President, Marketing and
Development, Econoler Inc.; Tom Brett,
Chairman, Canadian Association of Energy
Service Companies; James Rose, Senior
Vice-President, Rose Technology Group
Limited; Hugh Sonnenberg, Marketing
Manager, Commercial Buildings Group

September 15

ELLIOT LAKE CHAMBER OF COMMERCE
Peter Seidel, President

September 23

ENERGY, MINES & RESOURCES CANADA
H. (Ted) Thexton, Advisor, Nuclear Power
Uranium & Nuclear Energy Branch

September 27

ENERGY, MINES AND RESOURCES CANADA
Kevin Cliffe, Assistant Director, Co-ordination
& Strategic Planning; Nick Macaluso, Economist
William Peden, Regional Director, Ontario
Conservation and Renewable Energy

October 3

ENERGY PROBE
Norman Rubin, Director, Nuclear Research;
David Poch, Lawyer & Researcher

September 26

ENSERVE FINANCIAL CORPORATION
Stephen Probyn, President,
Enserve Financial Corporation; R. W. (Herb)
Harmer, Senior Vice-President, Marketing,
Bechtel Group, Inc.

September 15

ETOBICOKE HYDRO
John Hastings, Vice-Chairman

September 19

FEDERATION OF ENGINEERING AND SCIENTIFIC
ASSOCIATIONS
Chris Bailey, Member at Large;
Kurt Johansen, Member at Large.

September 19

HOWARD GELLER, Consultant
American Council for an Energy-Efficient
Economy

September 20

JANICE HAMRIN, Executive Director
Independent Energy Producers
Sacramento, California

September 13

Dr. KENNETH HARE

September 22

INDEPENDENT POWER PRODUCERS' SOCIETY
OF ONTARIO
Nicholas Teekman, President;
Jake Brooks, Secretary

September 20

JOINT INDUSTRY TASK FORCE OF THE ELECTRICAL
INDUSTRY IN ONTARIO
Douglas Baldwin, Chairman & Vice-President,
Federal Pioneer; Robert Gillespie, Senior
Vice-President, General Electric Canada;
Arthur Bowker, Chief Executive Officer,
Municipal Electric Association; William
MacOwan, Head of Howden Group Canada; John
Lind, Vice-President, St. Mary's Cement

September 19

BERNIE JONES, President
Blue Apple Consulting, Inc.

September 20

BRIAN KELLY

September 15

JAMES LITCHFIELD, Director of Planning
Northwest Power Planning Council
Portland, Oregon

September 13

WILLIAM MARCUS, Consultant
JBS Energy

September 21

MINISTRY OF ENERGY

Ed Ciemiega, Director, Legal Branch;

August 3

Cliff Jutlah, Manager, Economics and Forecasts; Larry Moore, Co-ordinator, Electricity Planning Policy, Electricity Section; Richard Jennings, Policy Advisor, Energy Forecasts; Tony Rockingham, Senior Program Advisor, Electricity Efficiency, Electricity Conservation Unit; Nizar Jiwan, Policy Advisor; Bunli Yang, Acting Manager, Energy Management

September 14

MINISTRY OF THE ENVIRONMENT

Ian Veitch, Assistant Director, Environmental Assessment Branch; Michael McLeod, Supervisor, Provincial Unit, Environmental Assessment Branch

August 3

MULTISTREAM POWER CORPORATION

Steve Headford, President; Mike Dupuis, Vice-President, Operations; Jay Shepherd, Director

September 28

MUNICIPAL ELECTRIC ASSOCIATION

D. Carl Anderson, Chairman; Charlie Macaluso, Manager, Policy Division; Arthur J. Bowker, Chief Executive Officer

September 22

NEW ENGLAND POWER POOL

Phillip Otness, Executive Director

September 21

NIRABRO INDUSTRIES

Tim Richardson

September 21

ONTARIO HOME BUILDERS' ASSOCIATION

Paul Duffy, Ontario Regional Manager; Don Buchan, Director, Canadian Home Builders' Association

September 15

ONTARIO HYDRO

Robert Franklin, Chairman; Ted Burdette,
 Senior Vice-President, Finance & Services;
 Lorne McConnell, Vice-President, Corporate
 Planning; Dane MacCarthy, Vice-President,
 Energy Management; Dave Commissiong,
 Director, Marketing Operations Division
 Marketing Branch; Art Marriage, Director,
 System Planning; Don Mills, Director,
 Research Division; John O'Connor, Director,
 Public Relations; Hedley Palmer, Director,
 Market Services & Development; Barry Conway,
 Manager, Rates Department; Ken Snelson,
 Manager, Demand/Supply Integration; Bill
 Penn, Program Manager, Planning &
 Engineering Management Group; Don Falconer,
 Section Head, Community Studies & Public Hearings
 Department; Vicki Sharpe, Superintendent,
 Product Development Department; Mitch
 Rothman, Chief Economist; Jim McConnach,
 Assistant to the Director of System Planning

August 2
 August 4
 August 5
 August 8
 August 9
 August 10
 August 11
 September 28
 October 4
 October 5

ONTARIO HYDRO TOURS

August 12
 September 29

ONTARIO METIS AND ABORIGINAL ASSOCIATION

Charles Recollet, President; Christopher Reid,
 Legal Co-ordinator

September 19

ONTARIO NATURAL GAS ASSOCIATION

Charles Safrance, Senior Vice-President,
 Operations, Consumers' Gas & President,
 ONGA; Mark Wolnik, Vice-President, Operations,
 ICG Utilities (Ont.) Ltd. & 2nd Vice-President,
 ONGA; Dennis Cornelison, Vice-President,
 Marketing, AEG Oil & Gas Co.; Paul Pinnington,
 Managing Director, ONGA; Juri Otsason, Manager,
 Industrial Commercial Marketing, Consumers' Gas.

September 21

ORILLIA WATER, LIGHT AND POWER COMMISSION

Ray Hayhurst, General Manager

September 21

JIM OSTEN

DRI Energy & DRI McGraw-Hill

September 28

BOB PAEHLKE

Political Studies Dept.
 Trent University

September 28

PASSMORE ASSOCIATES INTERNATIONAL
Jeff Passmore, Consultant to the Committee;
David Argue, Consultant to the Committee

August 3
October 6

MIKE PAVEY, Consultant

September 28

JOHN ROBINSON
Department of Environment and Resources
Studies
University of Waterloo

September 14

SCEPTRE RESOURCES LIMITED
Steve Haberl, Vice-President

September 20

SOCIETY OF A.E.C.L. PROFESSIONAL EMPLOYEES
Dr. H. (Robert) Andrews
Central Issues & Energy Planning

September 27

SWEDISH AMBASSADOR
Ola Ullsten

September 26

TECHNICAL ADVISORY PANEL -
Ministry of Energy
Ralph Brooks, Chairman
Carl Beigie
George Govier
Janice Hamrin
James Litchfield

September 12

RALPH TORRIE

September 15

TOWN OF BLIND RIVER
Lila Cyr, Member of Council

September 23

TOWN OF ELLIOT LAKE
Roger Taylor, Mayor

September 23

TOWNSHIP OF THE NORTH SHORE
Joe Laffrenier, Member of Council

September 23

TRANSCANADA PIPELINES
David Russell, Director, Pipeline
Investments & Projects, TransCanada
PIPELINES; Frank Dixon, Manager, New
Business Development, Consumers' Gas

September 22

UNITED STEELWORKERS OF AMERICA John Simone, President, Local 5417; Bob Walsh, President, Local 5762; Dave Mellor, Local Staff Representative	September 23
WATERPOWER ASSOCIATION Ronald Dodakin, President; David Carter, Vice-President	September 27
GLANVILLE WILLIAMS Senior Technical Advisor Stone & Webster Canada Ltd.	September 22
WINDSOR UTILITIES COMMISSION Kent Edwards, General Manager	September 22
THE HONOURABLE ROBERT WONG Minister of Energy	August 2
W. C. WOOD CO. LTD. Ted Muffitt, Vice-President, Marketing	September 14

APPENDIX E

Select Committee on Energy - Exhibit List*

***Source:** Compiled by Tannis Manikel, Clerk of the Committee.

SELECT COMMITTEE ON ENERGY

EXHIBIT LIST

DATE	EXHIBIT NO.	
June 22, 1988	1/01/001	D.E.F. BLACHFORD - Brief, dated June 1988, entitled "Submission on Certain Ontario Hydro and Electricity Issues".
"	1/01/002	ONTARIO HYDRO - Submission, dated 10 June 1988, entitled "CRESAP Review".
"	1/01/003	LEGISLATIVE RESEARCH SERVICE - Press Clippings relating to Ontario Hydro.
"	1/01/004	PASSMORE ASSOCIATES INTERNATIONAL - Letter, dated 26 May 1988, addressed to Douglas Carrothers, Chairman, relating to the hiring of a consultant.
August 2, 1988	1/01/005	ONTARIO MINING ASSOCIATION - Submission dated 30 June 1988.
"	1/01/006	INCO - Submission with letter dated 30 June 1988.
"	1/01/007	THE JOINT INDUSTRY TASK FORCE - Submission dated June 1988.
"	1/01/007A	THE JOINT INDUSTRY TASK FORCE - Booklet entitled "What Electricity Means to Ontario".
"	1/01/008	C.I.L INC. - Submission dated 29 June 1988 from Roger A. Zampini, Manager, Raw Materials & Energy Forest Products.
"	1/01/009	ELECTRICAL AND ELECTRONIC MANUFACTURERS ASSOCIATION OF CANADA - Letter dated 30 June 1988 from Sundar Raj, Director, Markets and Information Programs.

DATE	EXHIBIT NO.	
August 2, 1988	1/01/010	GRANT GIANT YELLOWKNIFE MINES LIMITED - Letter dated 29 June 1988 from Peter M. Rowlandson, General Manager.
"	1/01/011	IPPSO - (Independent Power Producers' Society of Ontario) - Submission.
"	1/01/012	MARKHAM HYDRO ELECTRIC COMMISSION - Submission.
"	1/01/013	WINDSOR UTILITIES COMMISSION - Letter addressed to the Ministry of Energy dated 14 June 1988 from R. A. Battagello, Chairman.
"	1/01/014	AMPCO - (Association of Major Power Consumers in Ontario) - Submission dated 24 June 1988.
"	1/01/015	DU PONT CANADA INC. - Submission dated 8 July 1988 prepared by S. I. Olvet, Manager - Energy and Strategic Planning, Energy and Materials.
"	1/01/016	LINDE UNION CARBIDE CANADA LIMITED - Letter dated 5 July 1988 addressed to the Select Committee on Energy from I. R. Watson, Manager, Energy Affairs.
"	1/01/017	CANADIAN NUCLEAR ASSOCIATION - Submission dated 8 July 1988.
"	1/01/018	THE COAL ASSOCIATION OF CANADA - Submission entitled "Background to The Canadian Coal Industry".
"	1/01/019	THE CANADIAN MANUFACTURERS' ASSOCIATION - Submission entitled "Keeping Canada Competitive - Our Energy Future". A response to the Federal Government's Energy Options Program dated January 1988.

DATE **EXHIBIT NO.**

August 2, 1988	1/01/020	MINISTRY OF ENERGY - Package of material includes Statement by The Honourable Robert C. Wong, Minister of Energy; Response dated June 1988 from Ontario Hydro entitled "Ontario Hydro's Plan for Electricity Conservation & Efficiency Measures"; Report dated July 1988 entitled "Review of Ontario Hydro's Draft Planning Strategy"; Report dated July 1988 entitled "Review by Government Ministries of Ontario Hydro's Draft Demand/Supply Planning Strategy"; News Release dated 2 August 1988.
"	1/01/021	ONTARIO HYDRO - Notes for Remarks by Robert C. Franklin, Chairman and President, Ontario Hydro.
August 4, 1988	1/01/022	UNISYS CANADA INC. - Submission dated 5 July 1988 relating to the Ontario Report 666SP dated December, 1987.
"	1/01/023	ONTARIO HYDRO - Introduction and Presentation, dated August 1988.
August 5, 1988	1/01/024	ONTARIO HYDRO - Presentations dated August/September 1988.
August 8, 1988	1/01/025	ONTARIO HYDRO - Presentations, dated August 1988, relating to DSPS.
August 9, 1988	1/01/026	ONTARIO HYDRO - Presentations, dated August 1988, relating to DSPS.
August 10, 1988	1/01/027	ONTARIO HYDRO - Presentation, dated August 1988, relating to DSPS.
"	1/01/028	ONTARIO HYDRO - Presentation, dated August 1988, relating to DSPS.

DATE	EXHIBIT NO.	
August 10, 1988	1/01/029	ONTARIO HYDRO - Report entitled "Annual Report 1987".
"	1/01/030	ONTARIO HYDRO - Document entitled "Energy Efficiency in Appliances".
"	1/01/031	ONTARIO HYDRO - Response to Committee questions.
August 11, 1988	1/01/032	ONTARIO HYDRO - Response to Committee questions.
"	1/01/033	ONTARIO HYDRO - Response to Committee questions.
"	1/01/034	ONTARIO HYDRO - Presentation, dated August 1988, relating to DSPS.
August 12, 1988	1/01/035	ONTARIO HYDRO - Report dated 11 March 1987 entitled "The Electric Heat Pump: Something for Everybody" presented by David J. Young, P. Eng. at Ontario Hydro's Heat Pump Conference & Exhibition.
September 12, 1988	1/01/036	RICHARD W. WOODLEY - Submission dated 8 August 1988.
"	1/01/037	RAYMOND F. PASQUAN - Submission entitled "In Home Storage Batteries to Reduce Peak Demand".
"	1/01/038	JAMES RIVER-MARATHON, LTD. - Submission from E. L. Chiasson, P. Eng., Capital Program Manager.
"	1/01/039	CANADIAN ELECTRICAL ASSOCIATION - Submission dated 30 August 1988 from Wallace S. Read, President.
"	1/01/040	SOLCAN LTD. - Submission dated 19 August 1988 from Robert K. Swartman, P. Eng., President.
"	1/01/041	JOHN B. ROBINSON - Article entitled "Loaded questions - New approaches to utility forecasting".

DATE **EXHIBIT NO.**

September 12, 1988	1/01/042	WATERPOWER ASSOCIATION OF ONTARIO - Submission dated August 1988 from Ronald R. Dodokin, President.
"	1/01/043	MUNICIPAL ELECTRIC ASSOCIATION - Submission dated August 1988 from Carl Anderson, Chairman.
"	1/01/044	THE ONTARIO NATURAL GAS ASSOCIATION - Submission dated September 1988.
"	1/01/045	ONTARIO HYDRO - Copies of a set of overhead transparencies the Committee saw at the System Control Centre.
"	1/01/046	MINISTRY OF ENERGY - TECHNICAL ADVISORY PANEL - Opening statement by Ralph Brooks.
September 13, 1988	1/01/047	ONTARIO HYDRO - Response to Committee questions.
"	1/01/048	ONTARIO HYDRO - Report dated 30 November 1986 entitled "Pickering Nuclear Generating Station 'A' Decommissioning - Cost Study".
"	1/01/049	INDEPENDENT ENERGY PRODUCERS - Report dated 13 September 1988 prepared by Janice Hamrin entitled "U.S. Parallel Generation Program - Comments and Recommendations".
September 14, 1988	1/01/050	MINISTRY OF ENERGY - Presentation dated 14 September 1988.
"	1/01/051	UNIVERSITY OF WATERLOO - Presentation dated 14 September 1988 by Dr. John Robinson, Department of Environment and Resource Studies entitled "Outline of Testimony and Transparency Copies".
September 15, 1988	1/01/052	DOW CHEMICAL CANADA INC. - Submission dated 14 September 1988.

DATE	EXHIBIT NO.	
September 15, 1988	1/01/053	ENSERVE FINANCIAL CORPORATION - Submission dated 15 September 1988.
"	1/01/054A	ECONOLER INC. - Submission dated 9 September 1988 entitled "Summary of Econoler/USA's Participation in Electric Utility Sponsored Conservation and Demand Reduction Program".
September 19, 1988	1/01/054B	ECONOLER INC. - Package of information.
September 15, 1988	1/01/055	BRIAN KELLY/RALPH TORRIE - Copy of Slide Presentation dated 15 September 1988.
September 19, 1988	1/01/056	ETOBICOKE HYDRO - Submission dated Monday, 19 September 1988 entitled "Some Realistic Perspectives on Draft Demand/Supply Planning Strategy" prepared by John Hastings, Vice-Chairman.
"	1/01/057	CONSULTING ENGINEERS OF ONTARIO - Submission.
"	1/01/058	ONTARIO METIS AND ABORIGINAL ASSOCIATION - Notes for a presentation dated 19 September 1988.
September 20, 1988	1/01/059	STEVEN G. DIENER & ASSOCIATES LIMITED - Submission dated September 1988 entitled "An Overview of the Potential for Cogeneration Market Opportunities".
"	1/01/060	INDEPENDENT POWER PRODUCERS' SOCIETY OF ONTARIO (IPPSO) - Submission.
September 19, 1988	1/01/061	JOINT INDUSTRY TASK FORCE - Copy of Slides dated 19 September 1988.

DATE **EXHIBIT NO.**

September 19, 1988 **1/01/062**

THE FEDERATION OF ENGINEERING AND SCIENTIFIC ASSOCIATIONS - Submission dated 19 September 1988.

September 20, 1988 **1/01/063**

SCEPTRE RESOURCES LIMITED - Submission dated 20 September 1988 entitled "Natural Gas - A Viable Energy Supply Option for Ontario Electrical Power Generation".

" **1/01/064**

AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY - Submission dated 20 September 1988 entitled "U.S. Experience with Utility Demand Management".

" **1/01/065**

BLUE APPLE CONSULTING, INC. - Submission entitled "Natural Gas as an Electricity Supply Option for Ontario".

" **1/01/066**

INDEPENDENT POWER PRODUCERS' SOCIETY OF ONTARIO (IPPSO) - Submission dated 6 May 1987 entitled "Information Seminar on Independent Power in Ontario".

" **1/01/067**

INDEPENDENT POWER PRODUCERS' SOCIETY OF ONTARIO (IPPSO) - Submission dated 12 July 1988 entitled "Final Argument of the Independent Power Producers Society of Ontario".

" **1/01/068**

CANADIAN EARTH ENERGY ASSOCIATION - Submission dated 20 September 1988 entitled "Utility Benefits of Ground Source Heat Pumps".

" **1/01/069**

AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY - Submission dated May 1987 entitled "Residential Equipment Efficiency: A State-of-the-Art Review" prepared by Howard Geller for the Energy and Materials Program, Office of Technology Assessment.

DATE EXHIBIT NO.

September 21, 1988 1/01/070

JBS ENERGY - Submission dated September 1988 by William B. Marcus, Principal Economist entitled "Electric Utility Planning for the 1990s".

" 1/01/071

CASSELS, BROCK & BLACKWELL - Submission by Ian A. Blue entitled "Implications of the Free Trade Agreement for Canadian Electricity Exports".

" 1/01/072

KENNETH HARE - A report to the Minister of Energy dated 29 February 1988 entitled "The Safety of Ontario's Nuclear Power Reactors".

" 1/01/073

NORTHERN DEVELOPMENT COUNCILS' CHAIRMAN'S ADVISORY COMMITTEE - Copy of a resolution passed regarding rural electrification in Northern Ontario dated 20 June 1988.

" 1/01/074

CANADIAN NUCLEAR SOCIETY - Submission dated 6 September 1988 with a paper entitled "Closing the Circle: Returning Used Uranium to the Geologic Environment" prepared by William T. Hancox.

" 1/01/075

ORILLIA WATER, LIGHT AND POWER COMMISSION - Submission dated 21 September 1988.

" 1/01/076

ONTARIO NATURAL GAS ASSOCIATION - Copies of Slides presented to the Committee.

" 1/01/077

NEW ENGLAND POWER POOL - Submission dated 21 September 1988.

September 22, 1988 1/01/078

KENNETH HARE - Submission entitled "The Greenhouse Effect".

" 1/01/079A

NORTHWEST POWER PLANNING COUNCIL - Report dated 1986 entitled "Northwest Conservation and Electric Power Plan - Volume One".

DATE	EXHIBIT NO.	
September 22, 1988	1/01/079B	NORTHWEST POWER PLANNING COUNCIL - A report dated 1 October 1987 entitled "A Review of Conservation Costs and Benefits - Five Years of Experience under the Northwest Power Act".
"	1/01/080	THE CORPORATION OF THE TOWN OF DEEP RIVER - Submission dated September 1988 presented by Lyall Smith, Mayor entitled "Time to Flip the Switch".
"	1/01/081	TRANSCANADA PIPELINES/CONSUMERS' GAS - Submission dated 22 September 1988.
"	1/01/082	SOLAR ENERGY SOCIETY OF CANADA INC. - Submission dated 20 September 1988.
"	1/01/083	WINDSOR UTILITIES COMMISSION - Submission dated 22 September 1988 entitled "Notes for Remarks by Kent Edwards, P. Eng."
September 23, 1988	1/01/084	TOWN OF ELLIOT LAKE - Submission dated 4 March 1988 entitled "Elliot Lake: The Site for Ontario's LLRW Management Center".
"	1/01/085	ELLIOT LAKE CHAMBER OF COMMERCE - Submission dated September 1988.
"	1/01/086	UNITED STEELWORKERS OF AMERICA - District 6 - Submission dated 23 September 1988 entitled "Uranium in Ontario and the Future of Elliot Lake".
"	1/01/087	TOWN OF BLIND RIVER - Submission dated 23 September 1988.
"	1/01/088	TOWNSHIP OF THE NORTH SHORE - Submission dated 23 September 1988.

DATE EXHIBIT NO.

September 23, 1988 1/01/089A

ELLIOT LAKE EMPLOYMENT
CONSERVATION TASKFORCE -
Submission dated April 1986
entitled "The Importance of
Maintaining Production Levels
at the Elliot Lake Uranium
Mines".

" 1/01/089B

TOWN OF ELLIOT LAKE -
Submission dated September 1988
entitled "Uranium Mining in
Elliot Lake".

September 26, 1988 1/01/090

R. H. FERAHIAN - Letter
addressed to the Clerk of the
Committee dated 3 September
1988 with letters dated 17
June 1988 and 26 July 1988
addressed to Mr Bruce McOdrum,
Deputy Minister of Energy
relating to the safety of
nuclear power plants.

September 26, 1988 1/01/091

CANADIAN NUCLEAR ASSOCIATION -
Package of information entitled
"Seeking to Generate a Better
Understanding".

" 1/01/092

ENERGY PROBE - Submission dated
26 September 1988.

September 27, 1988 1/01/093

SOCIETY OF A.E.C.L.
PROFESSIONAL EMPLOYEES -
Submission dated 27 September
1988 entitled "Central Issues
in Energy Planning".

" 1/01/094

ENVIRONMENT CANADA - Conference
Statement dated 27 - 30 June
1988 entitled "The Changing
Atmosphere: Implications for
Global Security".

" 1/01/095

CHALK RIVER TECHNICIANS AND
TECHNOLOGISTS - LOCAL 1568 -
Submission dated September 1988
entitled "Meeting Ontario's
Energy Needs in the 1990s".

" 1/01/096

CHALK RIVER TECHNICIANS AND
TECHNOLOGISTS - LOCAL 1568 -
Submission entitled "What
Electricity Means to Ontario".

DATE	EXHIBIT NO.	
September 27, 1988	1/01/097	BRIDLEWOOD RESIDENTS' HYDRO LINE COMMITTEE - Submission dated 27 September 1988.
"	1/01/098A	ATOMIC ENERGY OF CANADA LIMITED - Notes for Presentation dated 27 September 1988 by D. S. Lawson, President, CANDU Operations.
"	1/01/098B	ATOMIC ENERGY OF CANADA LIMITED - Presentation dated 27 September 1988 by Dr K. W. Dormuth.
"	1/01/099	JOHN AHEARNE - Tables 1 to 10 relating to nuclear power units in certain countries.
"	1/01/100	H. (TED) THEXTON - Submission dated 27 September 1988 entitled "How Does the Ontario Nuclear Program Compare with Experience in Other Countries?"
September 28, 1988	1/01/101	MIKE PAVEY - Submission dated 28 September 1988 entitled "Interprovincial Electricity Purchases".
"	1/01/102	DRI ENERGY & DRI MCGRAW-HILL - Submission dated 20 July 1987 entitled "The Economic Impacts of Purchasing Electricity".
"	1/01/103	ROBERT PAEHLKE - Submission dated June 1988 entitled "Government Regulating Itself: A Canadian-American Comparison".
October 3, 1988	1/01/104	WILLIAM MARCUS - Report dated September 1988 entitled "Electric Utility Planning for the 1990s".
"	1/01/105	ROBERT AND HELEN HANSEN - Letter dated 28 September 1988 addressed to the Select Committee on Energy.

DATE	EXHIBIT NO.	
October 3, 1988	1/01/106	THE COAL ASSOCIATION OF CANADA - Report dated October 1988 entitled "Coal and Ontario's Energy: A Practical Partnership".
"	1/01/107	PROFESSOR MICHAEL BERKOWITZ - Submission entitled "The Opportunity Cost of Resources Used for Electricity Generation in Ontario".
"	1/01/108	WILLIAM PEDEN - Submission dated 3 October 1988 entitled "Energy Efficiency and Parallel/Cogeneration".
"	1/01/109	ENERGY, MINES AND RESOURCES - News Release dated 9 September 1988 entitled "Minister Masse Announces over \$600 Million to Support Energy R & D and Energy Efficiency and Diversity".
"	1/01/110	ENERGY, MINES AND RESOURCES - Submission dated 3 October 1988 entitled "Employment Impacts of Energy Management Investments".
"	1/01/111	ENERGY, MINES AND RESOURCES - Copies of Slides presented in Committee entitled "Employment Impacts of: Energy Management Investments".
"	1/01/112A	HELENE CONNOR-LAJAMBE - Submission dated 3 October 1988 entitled "Societal Costs of Capital Concentration in Electric Utilities".
"	1/01/112B	HELENE CONNOR-LAJAMBE - Paper presented at the 10th Conference of the International Energy Economists Association in Luxembourg 6 July 1988 in reference to "Societal Costs of Capital Concentration in Electric Utilities" entitled "James Bay: The Energy Forecasting Faux-Pas That Became an Economic Vicious Circle".

DATE	EXHIBIT NO.	
October 4, 1988	1/01/113A	DOW CHEMICAL - Copies of slides presented in Committee relating to the Sarnia Division Power Plant.
"	1/01/113B	DOW CHEMICAL - Copies of slides presented in Committee.
"	1/01/114	ONTARIO HYDRO - Response to questions in Committee dated 19 September 1988.
"	1/01/115	ONTARIO HYDRO - Submission dated 3 October 1988 entitled "Table 1 - Outlook for Canadian Natural Gas Prices".
October 5, 1988	1/01/116	ONTARIO HYDRO - Report dated September 1988 entitled "Draft Demand/Supply Planning Strategy - Report 666B SP".
"	1/01/117	ONTARIO HYDRO - Submission dated September 1988 entitled "The Short-Term Load Forecast - 1988 - 1993".
"	1/01/118	ONTARIO HYDRO - Final Presentation dated 5 October 1988 from Lorne McConnell, Vice-President, Corporate Planning.
October 6, 1988	1/01/119	FLORENCE MACKESY - Letter dated 4 October 1988 addressed to the Chairman of the Select Committee on Energy.
"	1/01/120	CANADIAN NUCLEAR ASSOCIATION - Response, dated 5 October 1988, to questions from Committee Members on 26 September 1988.

APPENDIX F

**Documentation and Commentary on
the Recommendations of the Previous
(i.e. 1985-86) Select Committee on Energy**

702/87-88

**SUMMARY AND STATUS OF RECOMMENDATIONS OF
PREVIOUS (1985-86) SELECT COMMITTEE ON ENERGY***

Prepared for:

Select Committee on Energy

Prepared by:

Jerry Richmond
Research Officer
Legislative Research Service

March 1988

*Projects prepared by the Legislative Research Service are designed in accordance with the requirements and instructions of the Committee making the request. The views expressed should not be regarded as those of the Legislative Research Service or of the individual preparing the project.

INTRODUCTION*

To succinctly highlight the findings of the previous Select Committee on Energy (1985-86) the recommendations of this Committee are listed below with some supporting commentary on the status of these recommendations.

This previous Committee was established on July 11, 1985 with a mandate "to inquire into and report within 10 months on Ontario Hydro affairs."¹ For the first phase of its hearings in the fall of 1985 the Committee focussed on the future of the Darlington Nuclear Generating Station. However, in the course of its analysis the Committee also analyzed the related issues of Ontario Hydro's planning process and the preliminary work on Hydro's demand supply study (now Demand Supply Planning Strategy (DSPS)). It released an interim report in December 1985 and a final report in July 1986.

In its December 1985 Interim Report on the Darlington Nuclear Generating Station this Committee recommended:²

*This status report is based upon the author's research role with the previous Select Committee on Energy (1985-86), review of key documents and consultation with Larry Moore of the Ministry of Energy (965-9603).

**SELECT COMMITTEE ON ENERGY
INTERIM REPORT (DECEMBER 1985) ON DARLINGTON**

Recommendation	Status
1. Without limiting the broad scope of the Committee as set out in its terms of reference, the Committee should give priority to an examination of the relationship between the Government of Ontario and Ontario Hydro for the purposes of clarifying the relationship, setting out the specific responsibilities of each and defining the mechanisms that can activate the responsibilities.	As noted below, this matter was addressed in the subsequent 1986 Report of this Select Committee. This matter would likely also be within the scope of the Ministry of Energy's "ongoing review of the Power Corporation Act." ³
2. The Committee should undertake an independent review of the Ontario Hydro demand/supply options study backed by such expertise as may be required to illuminate specific and critical issues embodied in it.	This matter is being addressed by the current Select Committee on Energy.
3. No further significant contracts for units 3 and 4 (of Darlington - a 4 unit generating station) should be let for materials not required for construction during the next 6 months while the Committee studies demand and supply options.	At the time, Ontario Hydro indicated that it was voluntarily restricting the letting of major contracts during this time period, the first 6 months of 1986, although it was apparently not specifically directed to do so by the government. ⁴ This recommendation has been overtaken by the subsequent government decision, as noted below, to complete the Darlington Nuclear Generating Station.

**RECOMMENDATION OF FINAL REPORT
SELECT COMMITTEE ON ENERGY (JULY 1986)**

In its Final Report (1986) this Select Committee made 26 recommendations. Some of the major themes of these recommendations were:

Darlington and the future of nuclear power (3 recommendations: #'s 1 -3); electrical system planning (13 recommendations: #'s 4 - 8, 14 - 20, and 23); conservation (5 recommendations: #'s 9 - 12, and 25); role of the Ontario Energy Board (3 recommendations: #'s 13, 17 and 22); future role of Select Committee on Energy (1 recommendation: #26); miscellaneous legislative requirement (1 recommendation: #21).

Recommendation	Status
1. Because of Darlington's low incremental cost and the uncertainties associated with short-term options, all units of Darlington should proceed on schedule.	On August 20, 1986 it was announced that Cabinet had accepted this recommendation that the Darlington N.G.S. should be completed. ⁵
2. In view of the established potential of other supply options and the apparent potential for pursuing demand management initiatives, no further commitment should be made for additional nuclear power stations at this time.	There is no intention to commit to an additional nuclear station, or another major supply alternative, until the DSPS review process is completed.
3. The Minister of Energy should appoint an independent panel of internationally-recognized experts to review, on a priority basis, the safety of the design, operating procedures and emergency plans associated with Ontario Hydro's CANDU nuclear generating plants. The panel should prepare a report to the Minister which should also be made available to Members of the Legislature.	On August 20, 1986 acceptance of this recommendation by Cabinet was announced. ⁶ On December 18, 1986, the appointment of Professor Kenneth Hare as Commissioner to review nuclear plant safety and "the design, operating procedures and emergency plans associated with Ontario Hydro's CANDU nuclear plants" was announced. ⁷
4. The Ontario Government should specify the social, environmental and political framework within which Ontario Hydro's planning is to take place.	This matter may be addressed as a result of the Ministry of Energy's review of the <u>Power Corporation Act</u> and <u>Ontario Energy Board Act</u> and could potentially also be addressed by the Select Committee on Energy (1988).

Recommendation	Status
5. Ontario should use its end-use model as the primary tool for forecasting future demand for electricity. Additional resources must be assigned to the task of acquiring the necessary data to make the end-use model operational as soon as possible.	This matter may be addressed through the Ministerial and Select Committee's reviews of DSPS.
6. As the basis of its planning exercise, Ontario should develop a range of plausible scenarios based on end-uses. Alternative resource mixes must then be evaluated over a range of plausible scenarios, rather than a single line, "most probable" forecast.	This matter may be addressed through the Ministerial and Select Committee's reviews of DSPS.
7. Prior to approval by the Board of Directors, a draft of Ontario Hydro's range of forecasts should be made available to the public and distributed widely to experts and interested parties. The external committee for reviewing the draft forecasts should become a formal requirement of Ontario Hydro's planning process.	This matter may be addressed through the Ministerial and Select Committee's reviews of DSPS.
8. Prior to final approval of the forecast by the Ontario Hydro Board of Directors, the Ministry of Energy should be required to publish, in addition to its own forecast range, a formal response to Ontario Hydro's draft forecast range.	This matter may be addressed in the Ministry of Energy's review of the <u>Power Corporation Act</u> and <u>Ontario Energy Board Act</u> . ⁸
9. Ontario Hydro must develop a comprehensive conservation strategy employing a wide range of programs to ensure that the benefits of conservation resources are distributed widely throughout the province. In its assessment of individual conservation options, Ontario Hydro must be explicitly prohibited from using the "no-losers" test as a screening tool. ⁹	This matter could be addressed by the current Select Committee in its review of DSPS.

Recommendation	Status
10. The Government should direct Ontario Hydro to initiate, as part of its resource plan, three large scale technical and market demonstration programs for conservation, up to \$25 million each, in each sector (residential, commercial and industrial).	This matter may be addressed by Ontario Hydro in its appearance before the current Select Committee and examined by the current Select Committee in its review of DSPS.
11. The Ministry of Energy should investigate the feasibility and desirability of provincial action in the development and implementation of labelling programs and efficiency standards to encourage the production and use of high efficiency appliances. The Ministry should develop a plan to encourage the construction of more efficient buildings using incentives and/or strengthening the existing building code.	The appliance aspect of this recommendation is considered in Bill 82 - <u>Energy Efficiency Act</u> (first Reading, December 16, 1987). The Ministry of Energy and Ministry of Housing are also reviewing the energy efficiency standards within the Ontario Building Code. ¹⁰
12. The <u>Power Corporation Act</u> should be amended to allow Ontario Hydro to engage in the full range of options for promoting conservation.	Note: This bill received third reading and Royal Assent on June 8, 1988 but as of December 16, 1988 had not been proclaimed.
13. The Minister of Energy should request the Ontario Energy Board to hold a public hearing to determine the price which best reflects the value of parallel generation to the system, and to determine the desirable amount of parallel generation that could be added to the system within the current planning horizon.	This matter may be considered by the current Select Committee and/or the Ministry of Energy in reviewing the <u>Power Corporation Act</u> .
	This matter may be considered by the Ministry of Energy in its review of the <u>Ontario Energy Board Act</u> .

14. The Ministry of Energy should develop and publish detailed plans for parallel generation options including:

- Specific targets;
- Financial and contractual arrangements;
- The role of Ontario Hydro in promoting parallel generation;
- Additional research, development and demonstration programs needed; and
- Information and marketing efforts.

The Government must direct Ontario Hydro to incorporate these plans into its own annual resource plans.

15. The major firm purchase option should not be pursued at this time. It should be re-evaluated once cost-effective indigenous resources, such as conservation and co-generation, have been utilized.

16. The Ontario Energy Board should be empowered to hold bi-annual public reviews of Ontario Hydro's Resource Development Plan, and publish a public report with recommendations to Cabinet.

17. The Ontario Energy Board should conduct a public review of the results of Ontario Hydro's demand and supply options study. This review should take place at least sixty days after a final report on the options and all supporting documents have been issued. Recommendations should be made to Cabinet in a public report.

These matters may be considered in the current Select Committee's review of DSPS or the Ministry's review of the Power Corporation Act.

Ongoing discussions are being conducted between Ontario Hydro and Hydro-Quebec and the "purchase option" could be considered by the current Select Committee.¹¹

This matter may be considered in the Ministry of Energy's review of the Power Corporation Act and Ontario Energy Board Act.

The matter was proposed as a motion by Mr. Brian Charlton, MPP, before the current Select Committee on Energy on February 29, 1988 but was defeated.¹² The current Select Committee, Ministerial Technical Advisory Panel and Interministerial Group are reviewing DSPS.

Recommendation	Status
18. Ontario Hydro's draft resource development plan and supporting documents should be published sixty days in advance of the hearings in a form determined by the Ontario Energy Board.	This matter may be considered in the Ministry of Energy's review of the <u>Ontario Energy Board Act</u> .
19. Ontario Hydro should publish, for review by the Ministry of Energy, a detailed evaluation of all strategic marketing programs including goals, objectives, costs, and benefits.	This matter may be addressed in the Ministry of Energy's review of the <u>Power Corporation Act</u> .
20. Ontario Hydro should produce, as part of its resource development plan, a scenario where environmental protection would be the top priority. This scenario should identify differences in options and costs from the recommended strategy.	This matter could be addressed in the Select Committee's review of DSPS.
21. As the Memorandum of Understanding is an important mechanism for maintaining Ontario Hydro's accountability, it should become a formal legislative requirement.	This matter may be addressed in the Ministry of Energy's review of the <u>Power Corporation Act</u> .
22. The <u>Ontario Energy Board Act</u> should be amended to give the Board the powers to regulate electricity rates.	This matter could be addressed in the Ministry of Energy's review of the <u>Power Corporation Act and Ontario Energy Board Act</u> .
23. Ontario Hydro should conduct open planning workshops to facilitate full and open discussion of planning issues prior to the finalization and publication of a draft resource plan.	This matter could be addressed by the Select Committee in its review of DSPS.
24. The Government should resolve the issue of intervenor funding.	This matter is the responsibility of the Attorney General and is being reviewed with regard to provincial affairs in general. ¹³

Recommendation	Status
25. Ontario Hydro should establish a special task force for each of the residential, commercial and industrial sectors for the explicit purpose of participating in the development and on-going monitoring of a conservation strategy for that sector.	This matter may be addressed by Ontario Hydro in its appearance before the current Select Committee.
26. The term of the Select Committee on Energy should be extended to allow it to review two specific items.	These matters could be addressed during the current Select Committees later deliberations.
<ol style="list-style-type: none"><li data-bbox="226 565 563 738">1. The establishment of a Consumer Advocate as a method of improving the representation of the interests of the general public in hearings related to electric power planning issues.<li data-bbox="202 760 563 839">2. The role of Municipal Utilities in facilitating demand-side activities.	

FOOTNOTES

¹Ontario, Legislative Assembly, Hansard: Official Report of Debates, 33rd Parliament, 1st Session (11 July 1985): 695. On 14 May 1986 the mandate of this Committee was extended "to provide that the Committee report on its inquiries on Ontario Hydro affairs on or before 29 May 1986" (Ontario, Legislative Assembly, Hansard: Official Report of Debates, 33rd Parliament, 2nd Session (14 May 1986): 564).

²Ontario, Legislative Assembly, Select Committee on Energy, Report on Darlington Nuclear Generating Station (Toronto: The Committee, December 1985), pp. ES-2 and ES-3.

³Ontario, Ministry of Energy, "Remarks by the Honourable Robert C. Wong, Ontario Minister of Energy to the Municipal Electric Association Annual General Meeting," 29 February 1988, Toronto, p. 2.

⁴This matter was discussed with Larry Moore, Coordinator, Electricity Planning Policy, Electricity Section, Ministry of Energy at 965-9603.

⁵Ontario, Ministry of Energy, "Cabinet Accepts Select Committee Recommendations on Darlington and Nuclear Safety Review" (Toronto: The Ministry, 20 August 1986).

⁶Ibid.

⁷Ontario, Legislative Assembly, Hansard: Official Report of Debates, 33rd Parliament, 2nd Session (18 December 1986): 4371.

⁸"Remarks by the Honourable Robert C. Wong," pp. 4-5.

⁹The "no losers test" is defined as "a test which allows utility expenditure on a demand option up to a maximum, beyond which further expenditures would cause rates to rise above the level associated with installation of the alternative supply option" (Ontario Hydro, Draft Demand Supply Planning Strategy, Report 666 SP (Toronto: Ontario Hydro, December 1987), p. 13-8).

¹⁰This particular matter was discussed with Larry Moore of the Ministry of Energy.

¹¹Harvey Schacter, "Ontario, Quebec probe huge hydro deal," Kingston Whig-Standard, 8 March 1988.

¹²Ontario, Legislative Assembly, Select Committee on Energy, "Draft Transcript," 29 February 1988, p. 20.

¹³This matter was discussed with Larry Moore of the Ministry of Energy.

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